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THE
LIFE OF
JAMES M. SMITH
BY
JAMES M. SMITH



*"A simple unornamented grave there,
causes more tears to flow than the gaudy
splendour of a cathedral interment"*

ST. PIERRE



*Let us walk into some flowery valley
And sing a hymn of praise to our Creator.*

July 18.

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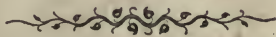
PHILADELPHIA.



ST. PIERRE'S.
STUDIES OF NATURE.

TRANSLATED BY

HENRY HUNTER, D.D.



PHILADELPHIA:

J. & J. L. GIHON, 98 CHESTNUT ST.

THE UNIVERSITY OF CHICAGO

STUDIES OF NATURE

1911

Volume 1

BY J. H. M. SMITH

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ADVERTISEMENT.

THE present American edition of ST. PIERRE'S STUDIES OF NATURE cannot be better introduced to the World, than in the nervous and elegant language of DR. HUNTER'S Preface to the London edition.

‘I have read,’ says he, ‘few performances with more complete satisfaction, and with greater improvement, than the STUDIES OF NATURE: in no one have I found the useful and the agreeable more happily blended. What work of science displays a more sublime theology, inculcates a purer morality, or breathes a more ardent and more expansive philanthropy? ST. PIERRE has enabled me to contemplate the Universe with other eyes, has furnished new arguments to combat Atheism, has established beyond the power of contradiction the doctrine of a universal Providence, has excited a warmer interest in favour of suffering humanity, and has disclosed sources unknown of intellectual enjoyment. Unfettered by system, unawed by authority, he looks immediately into Nature: he observes, he thinks, he reasons for himself; and teaches his Reader thus to observe, think, and reason.’

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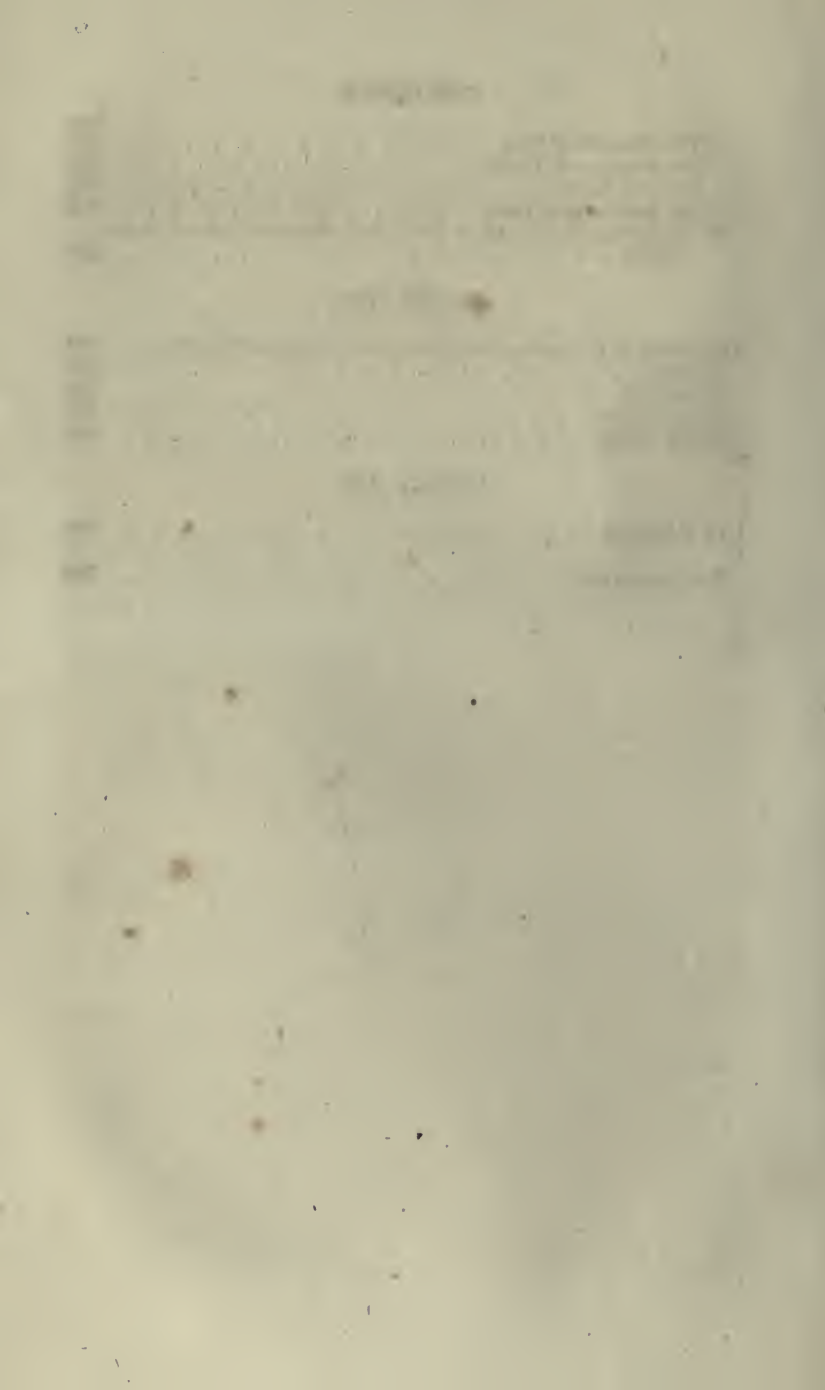
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STUDIES OF NATURE.

STUDY FIRST.

IMMENSITY OF NATURE: PLAN OF MY WORK.

SOME years have elapsed, since I formed the design of composing a general History of Nature, in imitation of Aristotle, Pliny, Chancellor Bacon, and several illustrious modern authors. The field appeared to me so vast, that I could not believe the possibility of its being entirely preoccupied. Nature invites to the cultivation of herself, persons of every age and country; especially those who, like myself, pause at every step they advance, transported at the beauty of her divine productions.

In Nature herself alone, we must expect to find the laws of Nature; and we plunge into difficulty and distress, only in proportion as we deviate from those laws. I proposed, therefore, to begin my Work, when I had ceased from observing, and collected all the materials necessary to a History of Nature; but I found myself in the condition of the child, who, with a shell, had dug a hole in the sand, to hold the water of the ocean.

Nature is of unbounded extent, and I am a human being, limited on every side. Not only her general history, but that of the smallest plant, far transcends my highest powers. Permit me to relate, on what account I became sensible of this.

One day, in summer, while busied in the arrangement of some observations which I had made, respecting the harmonies discoverable in this globe of ours, I perceived, on a strawberry plant, accidentally placed in my window, some small winged insects, so very beautiful that I took a fancy to describe them. Next day a different sort appeared, which I proceeded likewise to describe. In the course of three weeks, no less than thirty-seven species, totally distinct, had visited my strawberry plant; at length they came in such

crowds, and presented such variety, that I was constrained to relinquish the amusement for want of leisure, and, to say the truth, for want of expression.

However minute these objects may be, they surely merited my attention, as Nature deemed them not unworthy of hers. Could I refuse them a place in my general history, when she had given them one in the system of the Universe? For a still stronger reason, had I written the history of my strawberry plant, I must have given some account of the insects attached to it. Plants are the habitation of insects; and it is impossible to give the history of a city, without saying something of its inhabitants. Besides, my strawberry plant was not in its natural situation, in the open country, on the border of a wood, or by the brink of a rivulet, where it could have been frequented by many other species of living creatures. It was confined to an earthen pot, amidst the smoke of Paris, and I observed it only at vacant moments. I knew nothing of the insects which visited it during the course of the day; still less of those which might come only in the night, attracted by simple emanations, or perhaps, by a phosphoric light, which escapes our senses. I was totally ignorant of the various species which might frequent it, at other seasons of the year, and of the endless other relations which it might have with reptiles, with amphibious animals, fishes, birds, quadrupeds, and, above all, with man, who undervalues every thing which he cannot convert to his own use.

But it was not sufficient to observe it, from the heights of my greatness, if I may use the expression; for in this case, my knowledge would have been greatly inferior to that of one of the insects, who made it their habitation. Not one of them, on examining it with his little spherical eyes, but must have distinguished an infinite variety of objects, which I could not perceive without the assistance of a microscope, and after much laborious research. Nay, their eyes are inconceivably superior even to this instrument; for it shows us objects only which are in its focus, that is at the distance of a few lines; whereas they perceive, by a mechanism of which we have no conception, those which are near and those which are far off. Their eyes, therefore, are at once microscopes and telescopes. Besides, by their circular disposition round the head, they have the advantage of viewing the whole

circuit of the heavens at the same instant, while those of the astronomer can take in, at most, but the half. My winged insects, accordingly, must discern in the strawberry plant, at a single glance, an arrangement and combination of parts, which, assisted by the microscope, I can observe only separate from each other, and in succession.

On examining the leaves of this vegetable, with the aid of a lens which had but a small magnifying power, I found them divided into compartments, hedged round with bristles, separated by canals, and strewed with glands. These compartments appeared similar to large verdant enclosures, their bristles to vegetables of a particular order; of which some were upright, some inclined, some forked, some hollowed into tubes, from the extremity of which a fluid distilled; and their canals, as well as their glands, seemed full of a brilliant liquor. In plants of a different species, these bristles, and these canals, exhibit forms, colours, and fluids, entirely different. There are even glands, which resemble basons, round, square, or radiated.

Now, Nature has made nothing in vain. Wherever she has prepared a habitation, she immediately peoples it. She is never straitened for want of room. She has placed animals, furnished with fins, in a single drop of water, and in such multitudes, that Leewenhoeck, the natural philosopher, reckoned up to thousands of them. Many others after him, and among the rest Robert Hook, have seen, in one drop of water, as small as a grain of millet, some 10, others 20, and some as far as 45 thousand. Those who know not how far the patience and sagacity of an observer can go, might, perhaps, call in question the accuracy of these observations, if Lyonnet, who relates them in Lesser's *Theology of Insects*, book ii. chap. 3, had not demonstrated the possibility of it, by a piece of mechanism abundantly simple. We are certain, at least, of the existence of those beings whose different figures have actually been drawn. Others are found, whose feet are armed with claws, on the body of the fly, and even on that of the flea.

It is credible, then, from analogy, that there are animals feeding on the leaves of plants, like the cattle in our meadows, and on our mountains; which repose under the shade of a down imperceptible to the naked eye, and which, from goblets formed like so many suns, quaff nectar of the colour

of gold and silver. Each part of the flower must present to them a spectacle of which we can form no idea. The yellow *antheræ* of flowers, suspended by fillets of white, exhibit to their eyes double rafters of gold in equilibrio, on pillars fairer than ivory ; the *corolla*, an arch of unbounded magnitude, embellished with the ruby and the topaz ; rivers of nectar and honey ; the other parts of the flowret, cups, urns, pavilions, domes, which the human architect and goldsmith have not yet learned to imitate.

I do not speak thus from conjecture ; for having examined one day, by the microscope, the flowers of thyme, I distinguished in them, with equal surprise and delight, superb flagons, with a long neck, of a substance resembling amethyst, from the gullets of which seemed to flow ingots of liquid gold. I have never made observation of the *corolla* simply, of the smallest flower, without finding it composed of an admirable substance, half transparent, studded with brilliants, and shining in the most lively colours.

The beings which live under a reflex thus enriched, must have ideas very different from ours, of light, and of the other phenomena of Nature. A drop of dew, filtering in the capillary and transparent tubes of a plant, presents to them thousands of cascades ; the same drop, fixed as a wave on the extremity of one of its prickles, an ocean without a shore ; evaporating into air, a vast aerial sea. In these ephemeral beings, we must find the youth of a single morning, and the decrepitude of one day. If they possess historical monuments, they must have their months, years, ages, epochs, proportioned to the duration of a flower. Thus, in proportion as man brings the elements of Nature near him, the principles of science disappear.

Such, therefore, must have been my strawberry plant, and its natural inhabitants, in the eyes of the winged insects, which had alighted to visit it ; but supposing I had been able to acquire, with them, an intimate knowledge of this new world, I should still have arrived no farther than at the history of the *genus*, and not that of the *species*. The varieties would still have remained unknown, which have each its particular character, according as they have flowers single, in pairs, or disposed in clusters ; according to the colour, the smell, and the taste of the fruit ; according to the size, the figure, the edging, the smoothness, or the downy clothing of

their leaves. One of our most celebrated botanists, Sebastian le Vaillant, author of *Botanicon Parisiense*, has found, in the environs of Paris alone, five distinct species, three which bear flowers, without producing fruit. In our gardens, we cultivate at least twelve different sorts of foreign strawberries; but how many varieties are there, to us totally unknown! Has not every degree of latitude a species peculiar to itself? Bearing in mind, therefore, that all species, varieties, analogies, affinities, have, in every particular latitude, necessary relations with a multitude of animals, and that these relations are altogether unknown to us, we shall find, that a complete history of the strawberry-plant would be ample employment for all the naturalists in the world.

What a task then, would it be, to write the history, in like manner, of all the species of vegetables which are scattered over the whole earth? The celebrated Linnæus reckoned up from seven to eight thousand of them; but he had not travelled. The famous Sherard, it is said, was acquainted with sixteen thousand. Another botanist swells his catalogue up to twenty thousand. Finally, one still more modern, boasts of having himself made a collection of twenty-five thousand; and he estimates the number of those which he has not seen, at four or five times as many. But all these enumerations must be extremely defective, if it is considered, as has been remarked by this last observer himself, that we know little or nothing of the interior of Africa; of that of the three Arabias, and even of the two Americas; very little of New Guinea, New Holland, and New Zealand, and of the innumerable islands of the South Sea, the greatest part of which are themselves still undiscovered. We know hardly any thing of the isle of Ceylon, except a little of the coast; and of the great island of Madagascar; of the immense archipelagoes of the Philippines and Moluccas, and of almost all the Asiatic islands. As to that vast Continent, with the exception of some great roads in the interior, and some part of the coast resorted to by the traffic of Europe, we may affirm that it is wholly unknown to us.

How many immense districts are there in Tartary, in Siberia, and even in many of the kingdoms of Europe, where the foot of botanist never trod! Some, indeed, have given us a herbal of Malabar, Japan, China, &c. but if we reflect, that, in these countries, their researches never penetrated be-

yond the sea-coast, and were generally confined to one season of the year, when a part only of the plants, peculiar to each climate, appear; that they have visited only the narrow regions adjoining to our European factories; that they have never dared to plunge into deserts, where they could have found neither subsistence nor guide; nor ventured themselves among the numerous tribes of barbarous nations, whose language they could not understand; we shall find reason to conclude, that their boasted collections, however valuable, are still extremely defective.

In order to be convinced of this, we have only to compare the time employed by them, in making their collections of plants in foreign countries, with that which it cost Le Vaillant to collect those of the vicinity of Paris only. The learned Tournefort made botany a particular study; and, after a master so indefatigable, Le Vaillant had the courage to retrace the same ground, and discovered so many distinct species, overlooked by Tournefort, that he doubled, at least, the catalogue of our plants. He made it amount to fifteen or sixteen hundred; not including in this enumeration those which differ only in the colour of the flowers, and the spots of the leaves, though Nature frequently employs such signs as these in the vegetable world, to distinguish the species, and to form their true characters.

Sebastian le Vaillant, accordingly, employed no less than twenty-six whole years, in his own country, and with the assistance of his pupils, in completing his botanical description of the plants of a few square leagues; whereas the persons who pretend to give us the botany of many foreign countries, were alone and unassisted, and despatched the business in a few months. But, though his sagacity and perseverance seem to have left us nothing more to wish for, I have my doubts, whether he has made a complete collection of all the gifts which Flora scatters over our plains; and whether he has seen, if I may use the expression, to the bottom of the basket.

For my own part, if I might be permitted to hazard a conjecture, respecting the number of distinct species of plants, spread over the earth, such is my idea of the immensity of Nature, and of her subdivisions, that I am disposed to believe, there is not a square league of earth but what presents some one plant peculiar to itself, or, at the least, which thrives there

better, and appears more beautiful, than in any other part of the world. This makes the number of the primordial species of vegetables amount to several millions, diffused over as many millions of square leagues, of which the surface of our globe consists. The farther south we advance, the more their variety increases within spaces of the same dimension. The isle of Otaheite, in the South Sea, was found to have a botany peculiar to itself, and which had nothing in common with that of the places in Africa and America, situated in the same latitude; nay, totally different from that of the adjacent islands. And if we reflect, that each plant has several different names, in its own country; that every nation imposes particular denominations, and that all these names, at least the greater part, are varying every age, what difficulties does not the vocabulary alone oppose to the study of botany.

All these preliminary notions, however, would still form only an useless science, did we even know, in the most complete detail, all the parts of which plants are composed. It is the combination of these parts, the attitude of the plants, their port, their elegance, the harmonies which they form, when grouped, or in contrast with each other, which it would be interesting to determine. I do not know that any thing has been so much as attempted on this subject.

As to their virtues, it may be affirmed, that they are for the most part unknown, neglected, or abused. Their qualities are frequently perverted, in making cruel experiments on innocent animals, while they might be usefully employed as miraculous remedies, to counteract the ills of human life. We have preserved, for example, in the Royal Cabinet at Paris, arrows more formidable than those of Hercules, though dipped in the blood of the snake of Lerna. Their points are impregnated with the juice of a plant so venomous, that, though exposed to the air for many years, they can, with the slightest puncture, destroy the most robust of animals in a few minutes. The blood of the creature, be the wound ever so trifling, instantly congeals. But if the patient, at the same instant, is made to swallow a small quantity of sugar, the circulation is immediately restored. Both the poison and the antidote have been discovered by the savages who inhabit the banks of the Amazon; and it is of importance to observe, that they never employ in war, but only in the chase, this murderous method of destroying life.

of one man of genius would be scarcely sufficient to compose the history of a few insects. However curious may be the memoirs transmitted to us, respecting the manners, and the anatomy, of the animals most familiarly known, in vain do we still flatter ourselves with having acquired a complete acquaintance. The principal requisite, in my opinion, is yet wanting ; I mean, the origin of their friendships and of their feuds. In this consists, if I am not mistaken, the essence of their history, to which must be referred their instincts, their loves, their wars ; the attire, the arms, and the very form which Nature gives them. I know not of any naturalist who has engaged in a research of this sort. The poets have endeavoured to explain these wonderful and innate instincts, by their ingenious fictions. The swallow Prognè flies the forest ; her sister Philomela delights to sing in solitary places. Prognè thus, one day, addresses her :

Why waste such sweetness on the desert air ?
Come, charm the city with thy tuneful note ;
Think too, in solitude, that form so fair
Felt violation : flee the horrid thought.

Ah ! sister dear, sad Philomel replies,
'T is this that makes me shun the haunts of men :
Tereus and Courts the anguish'd heart allies,
And hastes, for shelter, to the woods again.

I never hear the enchantingly melancholy song of a nightingale, shrouded in shrubbery, and the lengthened pioupiou, which interrupt, like sighs, the music of that solitary warbler, without believing, that Nature had revealed her adventure to the sublime La Fontaine, at the time she inspired him to compose these verses. Philosophers of name, unfaithful to the testimony of their reason and conscience, have dared to represent them as mere machines. They ascribe to them blind instincts, which regulate all their actions, without passion, without will, without choice, and even without any degree of sensibility. I expressed my astonishment one day to J. J. Rousseau, that men of genius should maintain a position so extravagant. He very sagely replied, "The solution is this, When man begins to reason, he ceases to feel."

In order to confute the opinions of such philosophers, I shall have recourse, not to those animals whose sagacity and industry excite our admiration, such as the beaver, the bee,

the ant, and such like. I shall produce only one example, taken from the class of those which are most indocile, namely fishes, and shall select it from among a species, governed by an instinct the most impetuous and the most stupid, that of gluttony.

The shark is so voracious, that he will not only devour his own species, when pressed by hunger, but swallows, without distinction, every thing that drops from a ship into the sea, cordage, cloth, pitch, wood, iron, nay, even knives. Nevertheless, I have witnessed his abstinence, in two remarkable circumstances; the one is, however urged by famine, he never touches a kind of small fish, speckled with yellow and black, called the pilot-fish, which swims just before his snout, to guide him to his prey, which he cannot see till he is close to it; for Nature, as a counterbalance to the ferocity of this fish, has rendered him almost blind. The other case is this, when you throw into the sea a dead fowl, the noise brings him to the spot, but on discovering it to be a fowl, he immediately retires, without devouring it: this has furnished sailors with a proverb, 'The shark flies from the feather.' It is impossible, in the first case, not to ascribe to him some portion of understanding, which represses his voracity, in favour of his guide; and not to attribute, in the second, his aversion to feathered flesh, to that universal reason, which, destining him to live along the shallows, where cadaverous substances, of creatures perishing in the sea, fall and are deposited, inspires him with an aversion for feathered animals, that he may not destroy the sea-fowls, which resort thither in great numbers, employed, like himself, in looking out for a livelihood, and in cleansing the shores from impurities.

Other philosophers, on the contrary, have ascribed the manners of animals, as those of men, to education; and their natural affections, as well as their animosities, to resemblance or dissimilitude of form. But if friendship is founded in similitude of form, how comes it that the hen, who walks in security at the head of her brood, among the horses and oxen of a farm-yard, though part of her family is sometimes accidentally crushed by the feet of those animals, collects her young, with anxious inquietude, at the sight of the hawk, a feathered animal like herself, who appears in the air but as a black point, and whom, perhaps, she hardly, if ever, saw before? Why does the dog in the yard fall a barking in the

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The shark is so voracious, that he will not only devour his own species, when pressed by hunger, but swallows, without distinction, every thing that drops from a ship into the sea, cordage, cloth, pitch, wood, iron, nay, even knives. Nevertheless, I have witnessed his abstinence, in two remarkable circumstances; the one is, however urged by famine, he never touches a kind of small fish, speckled with yellow and black, called the pilot-fish, which swims just before his snout, to guide him to his prey, which he cannot see till he is close to it; for Nature, as a counterbalance to the ferocity of this fish, has rendered him almost blind. The other case is this, when you throw into the sea a dead fowl, the noise brings him to the spot, but on discovering it to be a fowl, he immediately retires, without devouring it: this has furnished sailors with a proverb, 'The shark flies from the feather.' It is impossible, in the first case, not to ascribe to him some portion of understanding, which represses his voracity, in favour of his guide; and not to attribute, in the second, his aversion to feathered flesh, to that universal reason, which, destining him to live along the shallows, where cadaverous substances, of creatures perishing in the sea, fall and are deposited, inspires him with an aversion for feathered animals, that he may not destroy the sea-fowls, which resort thither in great numbers, employed, like himself, in looking out for a livelihood, and in cleansing the shores from impurities.

Other philosophers, on the contrary, have ascribed the manners of animals, as those of men, to education; and their natural affections, as well as their animosities, to resemblance or dissimilitude of form. But if friendship is founded in similitude of form, how comes it that the hen, who walks in security at the head of her brood, among the horses and oxen of a farm-yard, though part of her family is sometimes accidentally crushed by the feet of those animals, collects her young, with anxious inquietude, at the sight of the hawk, a feathered animal like herself, who appears in the air but as a black point, and whom, perhaps, she hardly, if ever, saw before? Why does the dog in the yard fall a barking in the

night time, at the smell only of the fox, an animal which has a strong resemblance to himself? If habits of long standing could influence animals, as they do men, how has it been possible to render the ostrich of the desert familiar to such a degree, that he has been made to carry children on his plumeless crupper; whereas no skill has, hitherto, been able to tame the swallow, a bird which has, from time immemorial, built her nest in our houses?

Where can we find, among the historians of Nature, a Tacitus, who shall unveil to us these mysteries of the cabinet of Heaven, without an explanation of which, it is impossible to write the history of a single animal on the earth? We find no one species deviating, like the human, from the laws imposed upon it by Nature. Bees, universally, live in republics, as they did in the time of Esop. The common fly has always been a vagabond, one of a herd without any police or restraint. How comes it that, among these, no Lycurgus has ever yet arisen, to reduce them into order, for the general good; and to prescribe to them, as philosophers tell us the first legislators among men did, laws dictated by their weakness, and by the necessity of uniting in society?

To the difficulties opposed to us by Nature, let us add those which we ourselves throw in the way. First, methods and systems of all sorts prepare, in every man, his manner of viewing objects. Let us examine notions the most universally admitted, and supported by the highest authority.

✱To begin with geographers. They represent the earth as divided into four principal parts, whereas, in reality, there are only two. Instead of the rivers which water it, the rocks which form its barriers, the chains of mountains which divide it into climates, and other natural subdivisions, they exhibit it, speckled all over with party-coloured lines, which divide and subdivide it into empires, principalities, &c. They have disfigured the originals, or substituted names without a meaning, in place of those the native inhabitants of every country had given them, and which so well expressed their nature. They call, for example, a city, near to that of Mexico, where the Spaniards shed such oceans of blood, the City of Angels, but to which the Mexicans give the name of Ceut-lax-coupan, that is, The snake in the water, because that of two fountains, which issue from thence, one is poisonous; they call the Mississippi, that great river of North

America, which the natives denominate *Mechassipi, the father of waters* ; and so of an infinite number of other proper names. They have stripped the works of Nature of their distinctive characters, and nations of their monuments.

On reading these ancient names, with their explanations, in Garcillaso de la Vega, in Thomas Gage, and the earliest navigators, you have impressed on the mind, by a few simple words, the landscape of every country, and something of its natural history, without taking into the account the respect attached to their antiquity. Those only of the Chinese, who traffic with the Europeans, know that their country is called China. The name given by the inhabitants is *Chium-hoa, the middle kingdom*. They change the name of it, when the families of their sovereigns become extinct. Europeans have destroyed all these correspondencies ; for, obstinately persevering to give what names they please to the countries which they seize, or in which they settle, it comes to pass that, when you see the same countries on maps, or in Dutch, English, Portuguese, Spanish, or French books of travels, you are utterly incapable of distinguishing anything. Their very longitude is changed, for every nation now makes its own capital the first meridian.

Botanists mislead us still more. I have spoken of the perpetual variations of their dictionaries ; but their method is no less faulty. They must have magnifying glasses and scales, in order to class the trees of a forest. It is not sufficient to see them standing and covered with leaves, the botanist must examine the flower, and frequently the fruit too. The clown knows them all perfectly, in the boughs which compose his fagot. To show me the character of a flower, it is presented to me dry, discoloured, and spread out on the leaf of a herbary. Who can discover the queen of flowers in a dried rose ? X
In order to its being an object at once of love and of philosophy, it must be viewed when, issuing from the cleft of a humid rock, it shines on its native verdure, when the zephyr balances it, on a stem armed with thorns ; when Aurora has bedewed it with her tears ; when, by its lustre and its fragrance, it invites the hands of lovers. A cantharide, sometimes, lurking in its corolla, heightens the glowing carmine, by presenting the contrast of his emerald-coloured robe ; it is then this flower seems to say, that, symbol of pleasure, from her charms, and the rapidity of her decay, like pleasure too she carries danger around her, and repentance in her bosom.

Naturalists betray us into still wider deviations from Nature, in attempting to explain, by uniform laws, and by the mere action of air, water, and heat, the expansion of so many plants, growing on the same dunghill, of colours, forms, savours, and perfumes, so different. Do they try to decompose the principles of them? Poison and food present, in their stoves, the same results. Thus Nature sports herself with their art, as with their theory. The corn-plant alone, gathered in handfuls only by the vulgar, answers a thousand valuable purposes, while a multitude of vegetables have remained entirely useless, in the laboratories of the learned.

I remember having read, many years ago, several grave dissertations on the manner of employing the horse-chesnut as food for cattle. Every academy in Europe has, at least, proposed its own; and the result of all their learned disquisitions was, that the horse-chesnut was useless, unless prepared by a very expensive process, and that, even then, it was good only in the manufacture of tapers and hair-powder. I was astonished at this: not that naturalists should be ignorant of its use, and that they had studied it merely as an article of luxury, but that Nature should have produced a fruit of no use even to the brute creation: I was at last cured of my ignorance, by the brutes themselves. I happened to take my walk one day to the Bois de Boulogne,* with a branch of the horse-chesnut in my hand, when I perceived a goat feeding. I went up, and amused myself with stroking her. As soon as she perceived the horse-chesnut bough, instantly she seized and snapped it up. The lad who tended her told me, that the goats were all very fond of this plant, and that it contributed greatly to the increase of their milk. I perceived, at some distance, in the chesnut alley, which leads to the Chateau de Madrid, a herd of cows eagerly looking for horse-chesnuds, which they greedily devoured, without sauce or pickle. Thus, our learned and ingenious systems conceal from us natural truths, with which every peasant is acquainted.

What a spectacle do our cabinets of preserved animals present? To no purpose has the art of a Daubenton endeavoured to keep up the appearance of life. Let industry do its utmost to preserve the form, their stiff and motionless

* The Bois de Boulogne, and Chateau de Madrid, are a wood and castle, not many miles from Paris.

attitude, their fixed and staring eyes, their bristly hair, all declare that they have been smitten with the stroke of death. In such a state, even beauty itself inspires horror ; whereas objects the most homely are agreeable, when placed in the situation which Nature has assigned them. Our books of natural history are merely the romance of Nature, and our cabinets her tomb.

The history of man has been disfigured in a very different manner. If we except the interest which religion, or humanity, has prompted some good men to take, in favour of their fellow-creatures, historians have written under the impulse of a thousand different passions. The politician represents man, as divided into nobility and commonalty, into papists and huguenots, into soldiers and slaves ; the moralist, into the avaricious, the hypocritical, the debauched, the proud ; the tragic poet, into tyrants and their victims ; the comic, into drolls and buffoons ; the physician, into the pituitous, the bilious, the phlegmatic. They are universally exhibited as subjects of aversion, of hatred, of contempt ; Man has been universally dissected, and now nothing is shown of him but the carcass. Thus the master-piece of Creation, like every x thing else in Nature, has been degraded by our learning.

I do not mean to affirm, however, that from such partial means, no useful discovery has proceeded ; but all these circles, within which we circumscribe the Supreme Power, far from determining its bounds, only mark the limits of human genius. We accustom ourselves to crowd all our own ideas into that narrow space, and dishonestly to reject all that does not accord with them. We act the part of the tyrant of Sicily, who fitted the unhappy traveller to his bed of iron ; he violently stretched, to the length of the bed, the limbs of those who were shorter, and cut short the limbs of those who were longer. It is thus we apply all the operations of Nature y to our pitiful methods, in order to reduce the whole to one common standard.

Fiction embellishes the history of man only, it degrades that of Nature. [Nature is herself the source of all that is ingenious, amiable, and beautiful. By applying to her the violence of our imaginary laws, or by extending to all her operations those with which we are acquainted, we conceal others, worthy of the highest admiration, with which we are totally unacquainted. We add, to the cloud with which

she veils her divinity, that of our own errors ; and carry with us, in our search after truth, the passions of the college and of the world, intolerance and envy.

Those who enter first on the career, oblige those who come after them to walk in their footsteps, or to give it up ; as if Nature were their patrimony, or, as if the study of Nature were an exclusive trade, that did not admit of participation. What trouble did it cost to eradicate, in France, the metaphysics of Aristotle, which had become a species of religion ? The philosophy of Descartes, which supplanted it, might have subsisted to this day, had its revenues been ample. That of Newton, with its attractions, is not more solidly established. I have an unbounded respect for the memory of those great men, whose very deviations have assisted us, in opening great highways through the vast empire of Nature ; but, on more occasions than one, I shall combat their principles, and, especially, the general applications which have been made of them.

The earth is covered over with vegetables and animals, the simple vocabulary of which no scholar, no academy, no one nation, will ever be able perfectly to acquire ; but it is to be presumed, that the human race is acquainted with all their properties. In vain do enlightened nations boast, that they are the great repositories of all the arts and sciences. It is to savages, to men utterly unknown, that we are indebted for the first observations, which are the source of all science. It is neither to the polished Greeks nor Romans, but to nations which we denominate barbarous, that we owe the use of simples, of bread, of wine, of domestic animals, of cloths, of dye-stuffs, of metals, and of every thing most useful, and most agreeable, for human life.

× Modern Europe glories in her discoveries ; but the invention of the art of printing, one of the fairest titles to immortality, is to be ascribed to a person so obscure, that several cities of Holland, of Germany, nay, of China, have claimed the discovery as their own. Galileo would never have calculated the gravity of air, but for the observation of a fountain-player, who remarked that water could rise only up to thirty-two feet in the tubes of a forcing engine. Newton had never read the starry heavens, unless a spectacle-maker's children, in Zealand, had, at play with the lenses in their father's shop, suggested the first idea of the telescopic cylinder. Ourartil-

lery would never have subjugated the New World, but for the accidental discovery of gunpowder by a lazy monk ; and whatever glory Spain may pretend to derive from the discovery of that vast continent, the savages of Asia had planted empires there, long before the arrival of Christopher Columbus.

Advancing no higher claim, I presume to contribute my humble offering. It is the fruit of many years of application, which, amidst storms long and severe, stole away in these calm researches, like a single day of serenity. I earnestly wished, if it should not be permitted me to reach a boundary at which to stop, to communicate to others, at least the pleasure which I had enjoyed on my way.

I have conveyed my observations in the best style of which I am capable ; and have adopted the most simple method, without which, the confusion of the matter must have still more increased the insufficiency of the Author.

In the **FIRST PART** I will display the blessings bestowed by Nature, on the age in which we live ; and the objections which have been started in it, against the providence of its **AUTHOR**.

In the **SECOND PART**, I shall apply the laws of Nature to the globe ; examine its form, extent, the division of its hemispheres ; and as it is composed of parts similar, and of parts contrary, I shall consider its different elements, and the manner of their adaptation to each other. I shall point out the effect of the sun's heat and light ; shall speak of heaven, the moon, and stars ; of fire, air, and water ; the earth, seas, rivers, and mountains ; and examine for what reason Nature has divided the globe into two hemispheres ; what has rendered the communication of all its parts easy to a being so small and so feeble as man, and possible only to him ; demonstrating that the same Intelligence, whose productions we so justly admire in plants and animals, presides equally in the edifice which we inhabit.

In the **THIRD PART**, I will show how the different parts of plants correspond with the elements, so that, far from being a necessary production of theirs, as some philosophers pretend, they are almost always in opposition to their action. I shall adhere, however, to the exterior characters by which Nature seems to divide them into different *genera*. Their principal character is very difficult to determine, not only because the simplest plant unites a very great variety of relations to all

the elements, but because Nature does not place the character of her works in any one of the parts, but in their combination.

In the **FOURTH PART**, which treats of animals, I shall present their relations to the elements ; and we shall observe, as in the case of plants, that so many different configurations, far from being, in animals, mechanical effects of the action of the elements in which they live, are, on the contrary, almost always in the inverse ratio of these very causes. In the nests of animals, we shall look for their character ; and from these determine the element in which they must live, the aliment best adapted to their constitution, and the first lessons of industry, of love, or of ferocity, which they receive from their parents. However strange these indications may appear, they are those of Nature, who seems to tell us, that we may distinguish the characters of her children, like her own, in the fruits of love, and in the care which they take of their posterity. Attempts have frequently been made to propagate the breed of foreign animals in our parks ; but they all languish and die, because no care was taken to transplant with them their proper vegetable. You see them always restless, with the head hanging down, scratching up the ground, as if demanding from it the nourishment they had lost. A single herb would have been sufficient to quiet them, by recalling the tastes of their early life, the breezes which used to fan them, the cool fountains and refreshing shades of their native country ; less unhappy, however, than man, who can be cured of regret only by total loss of memory.

✕ In the **FIFTH PART**, I shall speak of **MAN**. Every work of Nature has presented to us, hitherto, only partial relations ; man will furnish such as are universal. Examining those in which he stands to the elements, we shall observe, that his eyes are turned, not towards heaven, but to the horizon ; so that he may view, at once, the heaven which illuminates, and the earth which supports him. His visual rays take in near half of the celestial hemisphere, and of the plane on which he treads, and their reach extends from the grain of sand, which he tramples under foot, to the star which shines over his head, at immeasurable distance.

✕ He alone, of animals, can enjoy equally day and night ; can bear to live within the torrid, and upon the ices of the frigid zone. If certain animals partake with him these ad-

vantages, it is only by means of his instructions, and under his protection. For all this he is indebted to the element of fire, of which he alone is the sovereign lord. Some authors pretend, that certain of the brute creation understand the management of it, and that the monkeys in America keep up the fires kindled by travellers in the forests. No one denies that they love its heat, and resort to it for warmth, when man retires. But as they have perceived its utility, why have they not preserved the use of it? However simple the manner of keeping up fire may be, by supplying it with fuel, not one of them will ever attain to that degree of sagacity.

The dog, much more intelligent than the monkey, a witness every hour of the effects of fire, accustomed, in our kitchens, to live only on meat that is dressed, if you give him raw flesh, will never dream of roasting it on the coals. This barrier, which separates man from the brute, weak as it may appear, is insurmountable to animals. And this is one of the great blessings of Providence, bestowed for the general security; for how many unforeseen and irreparable conflagrations would take place, were fire at their disposal? God has intrusted the first agent in Nature, to that being alone whom reason has qualified to make a right use of it.

While some historians bestow this faculty on the brutes, others deny it to man. They allege that many nations were destitute of it, till the arrival of Europeans among them. To prove this, they quote the inhabitants of the Marianne Islands, otherwise called the Isle of Thieves, by a calumnious imputation so common among sailors. But this assertion is grounded on bare supposition: namely, on the very natural astonishment expressed by these islanders, on seeing their villages set on fire by the Spaniards,* whom they had received with kindness. They contradict themselves, by relating, that these very people used canoes, daubed over with bitumen, which necessarily supposes, in the case of savages unacquainted with iron, that fire had been employed in hollowing their canoes, or, at least, in careening them. Finally, we are told, that they fed on rice, the preparation of which, however simple, requires, of necessity, the application of fire.

* See the History of their Discoveries, by Magellan; the History of the Marianne Isles, by Father Gobien, vol. ii. page 44; and that of the West Indies, by Herrera, vol. iii. pages 10 and 712.

This element is universally necessary to human existence, even in the hottest climates. [By means of fire alone, man guards his habitation, by night, from ravenous beasts of prey ; drives away the insects which thirst for his blood ; clears the ground of the trees and plants which cover it ; in a word, in every country, with fire he prepares his food, dissolves metals, vitrifies rocks, hardens clay, softens iron, and gives, to all the productions of the earth, the forms and combinations which his necessities require.]

The benefits which he derives from the air are no less extensive. Few animals are, like him, capable of respiring, with equal ease, at the level of the sea, and on the summit of the loftiest mountains. Man is the only being who gives it all the modulations of which it is susceptible. With his voice alone, he imitates the hissing, the cries, the singing of all animals ; while he enjoys the gift of speech, denied to every other. Sometimes he communicates sensibility to the air ; he makes it sigh in the pipe, complain in the flute, threaten in the trumpet, and to animate to the tone of his passions the brass, the box-tree, and the reed. Sometimes he makes it his slave ; forces it to grind, bruise, and move, to his advantage, an endless variety of machinery. In a word, he yokes it to his car, and constrains it to waft him even over the billows of the ocean.

That element, in which few of the inhabitants of earth are able to live, presents to man alone the easiest of communications. He swims, he dives in it, he pursues the sea-monster to the abysses of the deep ; he hunts and stabs the whale even under mountains of ice ; alights on every island in the bosom of the sea, and asserts his empire over it.

Whatever irregularity may appear on the surface of the earth, man is the only being formed with the capacity of pervading all its parts. There is established, among all his limbs, an equilibrium so perfect, so difficult to be preserved, so contrary to the laws of our mechanism, that there is no sculptor capable of forming a statue resembling man, broader and heavier above than below, which shall be able to maintain an erect position, and remain immoveable, on a basis so small as his feet. It would be quickly overset by the slightest breath of wind. How much more, then, would be requisite to make it walk like him ? There is no animal whose body is susceptible of so many different movements ; who unites

in himself all the possible varieties of animal motion ; who is equally adapted to clamber to the summit of the rock, to walk on the surface of the snow, to traverse the river and the forest, to pick the moss of the fountain, and the fruit of the palm-tree ; to feed the bee, and to tame the elephant. }

✧ In man Nature has collected every thing that is lovely in colour and in form, whether from harmony or contrast. To these she has added movements the most majestic and the most graceful. Indeed, so wonderful are these combinations, that all animals, in their natural state, are struck, at sight of him, with terror, or with love ; and as he is the only being who has the disposal of fire, the principle of life, so he alone practises agriculture, which is its support. The ox never thinks of resowing the grain which he treads out on the barn-floor, nor the monkey, the maize of the field which he plunders. Man alone raises his intelligence up to that of Nature. He not only pursues her plans, but recedes from them. He covers regions destined for forests, with corn and wine. He says to the pine of Virginia, and to the chesnut of India, " You shall grow in Europe." Nature seconds his efforts, and seems, by her complaisance, to invite him to prescribe laws to her.

For man Nature has covered the earth with plants, and though their species be infinite, not a single one but may be converted to his use. She has selected some out of every class, to minister to his pleasure or support, wherever he pleases to fix his habitation. She permits the plants most useful to him to grow in all climates ; but the domestic ones, from the cabbage up to the corn, alone, like man himself, are citizens of the world. The others serve for his bed, for his roof, for his clothing, for medicine, at least for fuel.

The animals are wonderfully formed, at once to live in situations the most rugged, and, animated by an instinct the most tractable, to associate with man. Every region is supporting a race of servants for him ; but those animals, in which are united the greatest number of utilities, live with him over the whole face of the earth. Delighting to pasture, each according to its nature, there is no corner of the earth where the whole vegetable crop may not be reaped ; and in the evening all return to the habitation of man, with murmurs, with bleatings, with cries of joy, bringing back to him the delicious tribute of innumerable plants, transformed, by a

process the most inconceivable, into honey, milk, butter, eggs, and cream.

While some philosophers assign to every species of dog a common origin, others ascribe a difference of origin to man. Their system is founded on the variety of size and colour in the human species ; but neither colour, nor stature, are distinctive characters, in the judgment of all naturalists. According to them, colour is merely accidental ; superior stature only a greater expansion of forms. Difference of species arises from the difference of proportions : now this characterizes that of dogs. The proportions of the human body nowhere vary ; the black colour, within the tropics, is simply the effect of the heat of the sun, which tinges man in proportion as he approaches the line ; and it is one of the blessings of Nature. His size is invariably the same in every age, and in all places, notwithstanding the influence of food and climate, by which other animals are so powerfully affected ; but from the tallest to the shortest of the human race, there is not, at most, the difference of a foot. Their stature is the same, at this day, as in the time of the Egyptians ; at Archangel as in Africa, as is evident from the length of mummies, and that of the tombs of the ancient Indians, found in Siberia, along the banks of the river Petzora.

The somewhat contracted stature of the Laplanders is to be imputed, I presume, to their sedentary mode of living ; for I have observed, among ourselves, a similar contraction of size in persons of occupations requiring little exercise. That of the Patagonians, on the contrary, is more expanded than that of the Laplanders, though they inhabit a latitude as cold, from their greater disposition to be moving about. The Laplander passes the greater part of the year shut up amidst his herds of reindeer ; whereas the Patagonian is perpetually a stroller, for he lives entirely by hunting and fishing. Besides, the first travellers to whom we are indebted for our knowledge of these two nations, have greatly exaggerated the smallness of the one, and the magnitude of the other. Man, over the whole globe, is at the centre of all magnitudes, of all movements, and of all harmonies. His stature, his limbs, his organs, have proportions so adjusted to all the works of Nature, that she has rendered them invariable as their combination. He constitutes, himself alone, a genus which has neither class nor species, dignified, by way of

excellence, with the title of MANKIND. In every age, man has been the friend of man, not merely from the interests of commerce, but by the more sacred, the more indissoluble bands of humanity. We are all bondsmen for each other. The happiness of every individual is attached to the happiness of mankind. He is under obligation to exert himself for the general good, because his own depends upon it. Instinct discovers to the animal its necessities only ; but man alone has raised himself from the dark womb of profound ignorance, to the knowledge and belief of a GOD : and on this knowledge are founded all the associations of the human race, without a single exception.

As man has formed his intellect on that of Nature, he has been obliged to regulate his moral sense by that of her AUTHOR. He felt that, in order to please Him who is the principle of all good, it was necessary to contribute to the general good ; hence the efforts made by man, in every age, to raise himself to God, by the practice of virtue. Thither he directs, without perceiving it, his hopes, his fears, his pleasures, his pains, his loves ; and passes his life in pursuing, or in combating, these fugitive impressions of DEITY.

✱ We shall have frequent occasion to remark, that the works of Nature exhibit contrasts, harmonies, and transitions, which wonderfully unite their different empires to each other. We shall examine by what magic it is, that the contrasts are productive at once of pleasure and pain, of friendship and hatred, of existence and destruction. From them proceeds that great principle of LOVE, which divides all the individuals into two great classes, objects loving and beloved. It opposes individual to individual by difference of sex, and genus to genus by that of forms, in order to extract from them harmonies innumerable.

✕ In the elements, light is opposed to darkness, heat to cold, earth to water, and their accords produce lights, temperatures, views, the most agreeable. In vegetables, in the forests of the north, the thick and gloomy foliage, the tranquil attitude and the pyramidical form of the fir, contrast with the tender verdure and moveable foliage of the birch, which presents the appearance of a pyramid inverted.

The same oppositions reign in the animal kingdom ; from the bee and the butterfly, up to the elephant and the camelpard, there is not a single animal on the earth but what has

its contrast, man only excepted. The contrasts of man are all within himself. Two opposite passions, love and ambition, balance all his actions. To love, are referable all the pleasures of the senses; to ambition, all those of the soul. These two passions are in perpetual counterpoise in the same subject; and while the first is accumulating on man every kind of corporeal enjoyment, and insensibly sinking him below the level of the beasts; the second prompts him to aim at universal dominion, and to exalt himself, at length, up to the DEITY.

Nature, however, has bestowed these two passions on man as a source of happiness. She produces an equal number of each sex, to direct the love of every man to a single object, and in that object she has united all the harmonies which are scattered over her most beautiful productions. There is between man and woman a wonderful analogy of forms, inclinations, and tastes; but there is a difference still greater, of these very qualities. Love results only from contrasts, and the greater they are, the more powerful is its energy; which might easily be demonstrated by the evidence of a thousand historical facts.

The influence of contrasts in love is so certain, that on seeing the lover, it would be easily possible to draw the portrait of the beloved object, without having seen it, provided only it were known that the passion was extremely violent. Of this I myself have made proof, on various occasions; among others, in a city where I was entirely a stranger. A gentleman of the place, one of my friends, carried me to visit his sister, a very virtuous young lady, and he informed me, as we were going, that she was violently in love. Being arrived at her apartments, and love happening to become the subject of conversation, it came into my head to say to her, that I knew the laws which determined our choice in love, and that, if she would permit me, I could draw her lover's picture, though he was utterly unknown to me. She bid me defiance: upon this, taking the opposite to her tall and buxom figure, to her temperament and character, which her brother had been describing to me, I painted her favourite as a little man, not overloaded with flesh, with blue eyes, and fair hair, somewhat fickle, eager after information. Every word I uttered made her blush up to the eyes, and she became seriously angry with her brother, accusing him of having be-

trayed her secret. This, however, was not the case, and he was fully as much astonished as herself.

The government of a good king has been compared to that of a father ; but the empire of a virtuous father can be compared only to that of God himself. Virtue is, to man, the true law of Nature. It is the harmony of all harmonies. Virtue alone can render love sublime, and ambition beneficent. It can derive the purest gratification even from privations the most severe. Rob it of love, friendship, honour, the sun, the elements, it feels that, under the administration of a Being just and good, abundant compensation is reserved for it, and it acquires an increase of confidence in God, even from the cruelty and injustice of man.

The spheres of all beings have a communication, by means of rays, which seem to unite their extremities ; and we shall find perhaps in our common gardens, appearances of Nature still more surprising. We shall see the pea, for example, pushing out its tendrils, precisely at the height where they begin to stand in need of support, and curling them round the boughs, with an address which can hardly be ascribed to chance. This seems to suppose intelligence ; but is a demonstration of goodness, not in the vegetable, but in the hand which formed it.

The sphere of animals extends still farther these wonderful harmonies. From the motionless shelly race, which pave and strengthen the capacious bed of the sea, to the fly who wings his way by night, over the plains of the torrid zone, glittering with rays of light like a star, you will find in them the configuration of rocks, of vegetables, of stars. Some of them compose noisy republics, others live in profound solitude. The whole life of some is employed in waging war, that of others in making love, not less varied than their animosities. One must have his seraglio ; another is satisfied with a transient mistress ; a third unites himself to a faithful companion, whom he never abandons till death makes the separation. Man unites, in his enjoyments, their pleasures and their transports ; and, satiated, sighs, and demands of Heaven felicity of a different kind.

We shall examine, simply by the light which reason supplies, whether man, subjected, by his body, to the condition of the animal creation, all whose necessities he unites in himself, is not, by his soul, allied to creatures of a superior order ;

and whether Nature has not reserved to herself some extraordinary means of interposing for the relief, even of the human race, undoubtedly as being the most wretched species of all.

That order which pervades the general combination of the spheres, subsists in the parts of each of the individuals which compose them. There is not a single one which has, in its organs, either deficiency or redundancy. Their mutual adaptation is so perceptible, and they possess characters so very striking, that if you were to show to a naturalist of ability any representation of a plant, or of an animal, which he had never seen, he could tell, from the harmony of its parts, whether it were a creature of the imagination, or a copy after Nature. ✕ Even the instincts of animals appear to be less adapted to their own personal utility, than to that of man; and are sometimes in harmony with the nature of the soil they inhabit, sometimes in opposition to it. The gluttonous hog delights to live in the mire, from which he is intended to purify the habitation of man; and the sober camel, to force his way through the burning sands of Africa, impervious, but for him, to every effort of the traveller. The appetites of these animals do not grow out of the places which they inhabit; for the ostrich, who is a fellow-tenant of the same deserts with the camel, is still more voracious than the hog.

No one law of magnetism, of gravity, of attraction, of electricity, of heat, or of cold, governs the world. These pretended general laws, are nothing more than particular means. ✕ Our sciences mislead us, by ascribing to Nature a false providence. They are not afraid of excluding from the heart of man that sentiment of the divine qualities, which communicates to him so much force; and of accumulating on his mind the weights and movements which oppress him. We can know that only which she makes us feel; and we can form no judgment of her works but in the place, and at the time, she is pleased to display them. All that we imagine, beyond this, presents only contradiction, doubt, error, or absurdity. Pain and death are among the proofs of her goodness. But for pain, we should be bruising ourselves every step we took, without perceiving it. But for death, new beings could not be raised into existence; and supposing those which already are in the world could be rendered eternal, that eternity would involve in it the ruin of the whole system of actual happiness.

In vain do we search, in our cradles, for the archives which our tombs deny us ; the past, like the future, covers our mysterious destiny with an impenetrable veil. In vain do we apply to it the light which illumines us, and seek, in the origin of things, the weights, the times, and the measures, which we find in their enjoyment ; but the order which produced them has, with relation to God, neither time, weight, nor measure. The divisions of matter and time were made only for circumscribed, feeble, transient man. [The universe, said Newton, was produced at a single cast. We are seeking for youth in what was always old, for old age in what is always young ; for germs in species, births in generations, epochs in nature ; but when the sphere, in which we live, issued from the hand of its divine AUTHOR, all times, all ages, all proportions, manifested themselves in it at once.]

To glance only on those general harmonies of the globe best known to us, behold how the sun constantly encircles with his rays one half of the earth, while night covers the other with her shade. How many contrasts and concords result from their ever-changing oppositions ? There is not a single point in the two hemispheres, in which there does not appear, by turns, a dawn, a twilight, an aurora, a noon, a setting of burnished gold, and a night sometimes studded with stars, sometimes clothed in a sable mantle.

The seasons walk hand in hand under his eye, like the hours of the day. Spring, crowned with flowers, precedes his flaming car ; Summer surrounds it with her golden sheaves ; and Autumn follows it, bearing her cornucopia running over with glossy fruit. In vain would Winter and night, retiring to the poles of the world, attempt to set bounds to his majestic career ; in vain do they raise out of the bosom of the polar seas of the north and of the south, new continents, with their valleys, their mountains, and their icy coruscations ; the father of day, with his fiery shafts, overturns the fantastic fabric ; and without descending from his throne, resumes the empire of the universe. Nothing can screen itself from his prolific heat. From the bosom of the ocean, he raises into the air the rivers which are afterwards to flow through the Old and New Worlds. He gives commandment to the winds to distribute them over islands and continents. These invisible children of the air transport them from place to place, pouring them out on the moun-

tains in dews, in rains, in hail, in snow, in impetuous torrents ; so that every part of the earth annually receives from them neither more nor less than its accustomed portion of water.

Every place possesses and presents in rotation, harmonies peculiar to itself. Run over, at pleasure, a meridian, or a parallel, you will find on it mountains of ice, and of fire ; plains of every level, hills of every curve ; islands of all forms, and rivers of all currents ; some spouting up, as if they issued from the centre of the earth, others precipitating themselves down in cataracts, as if descending from the clouds. Nevertheless, this globe, agitated with such a variety of convulsive movements, advances in a steady and unalterable course through the immensity of the heavens.

Beauties of a different order decorate its architecture, and render it habitable to sensible beings. A girdle of palm trees, to which are suspended the date and the cocoa, surrounds it between the burning tropics ; and forests of mossy firs begird it under the polar circles. The banana advances from the line to the southern shore of the Mediterranean. The orange crosses that sea, and embellishes, with its golden fruit, the southern extremities of Europe. The most necessary plants, such as corn and the gramineous tribes, penetrate the farthest, and, strong from their weakness, stretch, in the shelter of the valleys, from the banks of the Ganges to the shores of the Frozen Ocean. Others advancing from the rude climates of the north, make their way, under favour of the snows, into the very bosom of the torrid zone. The fir and cedar clothe the mountains of Arabia and Cachemire, and view at their feet the scorched plains of Aden and Lahore, where the date and the sugar-cane are reaped.

✕ But every soil has its Flora and its Pomona. The rocks, morasses, mire, and sand, have each vegetables peculiar to itself. The very shallows of the sea are fertile. The cocoa-tree thrives only on the strand, and suspends its milky fruit over the billows of the briny deep. Other plants are adapted to the winds, to the seasons, to the hours of the day, with such exact precision, that, by means of them, Linnæus constructed botanical almanacs and timepieces. Who is capable of describing the infinite variety of their figure ? What cradles, arches, avenues, pyramids of verdure, loaded with fruits, present the most enchanting habitations ! What happy republics lodge under their tranquil shade ! What

delicious banquets are there prepared ! * Nothing of them is lost. The quadrupeds eat the tender foliage, the feathered race the seeds, other animals the roots and rind, and insects feed on the offal.

Other tribes hold vegetables in contempt, and are adapted to the elements, to day, to night, to tempests, and to different parts of the globe. The eagle trusts her nest to the rock which loses itself in the clouds ; the ostrich, to the parched sands of the desert ; the rose-coloured flamingo, to the mires of the Southern Ocean. The white bird of the tropic, and the black frigate, take pleasure to sweep along, in company, over the vast extent of the seas, to view, from the highest regions of the atmosphere, the fleets of India toiling after them in vain, and to circumscribe the globe from east to west, disputing rapidity of flight with the sun himself.

In the same latitudes, the turtle-dove and the parroquet, less daring, travel only from isle to isle, having their young ones in their train, and picking-up, in the forests, the grains of spicery which they brush off as they hop from branch to branch. While fowls of this description preserve an equal temperature, under the same parallels, others find it in the track of the same meridian. Long triangles of wild-geese and of swans go and come every year from south to north, stop only at the hoary limits of winter, hurry, without desire or astonishment, over the populous cities of Europe, and look down with disdain on their fertile plains, which present the furrows of green corn in the midst of snow ; to such a degree does liberty appear preferable to abundance, even in the eyes of the animal creation !

On the other hand, legions of heavy quails cross the sea, and go to the south, in quest of the summer's heat. Toward the end of September, they avail themselves of a northerly wind to take their departure from Europe, and flapping one wing, while they present the other to the gale, half sail, half oar, they graze the billows of the Mediterranean, with their fattened rump, and bury themselves in the sands of Africa, that they may serve as food to the famished inhabitants of Zara.

There are animals which travel only by night. Millions of crabs, in the Antilles, descend from the mountains by the light of the moon, clashing their claws ; and present to the Caraihs, on the steril strand of their isles, innumerable shells

replenished with excellent marrow. At other seasons, on the contrary, the tortoise quits the sea, and lands on the same shores, to accumulate layers of eggs in their barren sands.

The very ices of the pole are inhabited. We find in their seas, and under their floating promontories of crystal, the black enormous whale, with more oil on his back than a whole plantation of olives could produce. Foxes clothed in precious furs, find the means of living on shores abandoned by the sun; herds of reindeer there scratch up the snow in search of moss, and advance, braying, into those desolate regions of night, by the glimmering light of the *aurora borealis*. Through a providence, worthy of the highest admiration, places the most unprolific present to man, in the greatest abundance, provisions, clothing, lamps, and firing, not of his own production.

How delightful would it be to behold the human race collecting all these various blessings, and communicating them to each other, in peace, from climate to climate! We look with expectation, every winter, to the period when the swallow and nightingale shall announce to us the return of serenity. How much more affecting would it be, to behold the people of distant lands arrive with the spring, on our shores, not with the dreadful noise of artillery, like modern Europeans, but with the sound of the flute and of the haut-boy, as the ancient navigators, in the earlier ages of the world! Winter itself would be no interruption to the communication of mankind. The Laplander, covered with warm fur, would arrive, under favour of the snow, in his sledge drawn by the reindeer, and expose for sale, in our markets, the sable skins of Siberia. Did men live in peace, every sea would be navigated, every region would be explored, all their productions would be collected. What a gratification of curiosity would it be to listen to the adventures of these foreign travellers, attracted to us by the gentleness of our manners! They would not be slow in communicating to our hospitality the secrets of their plants, of their industry, and of their traditions, which they will for ever conceal from our ambitious commerce.

Among the members of the vast family of mankind are the fragments of their history scattered. How interesting to learn that of our ancient separation, why each tribe chose a separate habitation, on an unknown globe; and traversed,

as chance directed, mountains which presented no path ; and rivers without a name !

What pictures would be presented to us in the descriptions of those countries, decorated with a pompous magnificence, as they proceeded from the hands of Nature, but wild, and unadapted to the necessities of man destitute of experience ! They would paint to us the astonishment of their forefathers at sight of the new plants which every new climate exhibited to their view, and the trials which they made of them as the means of subsistence ; how they were aided, no doubt, in their necessitous circumstances, and in their industry, by some celestial Intelligence, who commiserated their distress ; how they gradually formed an establishment ; what was the origin of their laws, of their customs, and of their religions.

What acts of virtue, what instances of generous love, have ennobled the deserts, and are unknown to our pride ! We flatter ourselves we have got a clear insight into the history of foreign nations, because we have collected a few anecdotes picked up at random by travellers. But this is much the same as if they were to compose ours from the tales of a mariner, or the artificial representations of a courtier, amidst the jealousies of war, or the corruptions of commerce. The knowledge and sentiments of a nation are not deposited in books. They repose in the heads, and in the hearts, of its sages ; if there be on earth such a thing as a secure asylum for truth.

If it be delightful to acquire knowledge, it is much more so to diffuse it. The noblest reward of science is the pleasure of the ignorant man instructed. [What a sublime satisfaction should it be to us, to enjoy their joy, to behold their dances in our public squares, and to hear the drums of the Tartar, and the ivory cornet of the Negro re-echo round the statues of our kings ! Ah, if we were good, I figure them to myself struck with astonishment and sorrow at the excessive and unhappy populousness of our cities, inviting us to spread ourselves over their solitudes, to contract marriages with them, and by new alliances to reunite the branches of the human race which are unhappily separating farther and farther, and which national prejudices disunite still more than ages and climates !

Alas ! blessings have been given us in common, and we communicate to each other only the ills of life. Man is

every where complaining of the want of land, and the globe is covered with deserts. Man alone is exposed to famine, while the animal creation, down to insects, are wallowing in plenty. Almost every where he is the slave of his equal, while the feeblest of animals maintain their liberty against the strongest. Nature, who designed him for love, denied him arms, and he has forged them for himself, to combat his fellow. She presents to all her children asylums and festivals; and the avenues of our cities announce our approach to them only by the sad spectacle of wheels and gibbets. The history of Nature exhibits blessings only, that of man nothing but robbery and madness. His heroes are the persons who have rendered themselves the most tremendous. Every where he despises the hand which spins the garment that clothes him, and which cultivates for him the fertile bosom of the earth. Every where he esteems his deceiver, and reveres his oppressor. Always dissatisfied with the present, he alone of beings regrets the past, and trembles at the thought of futurity. Nature has granted to him alone the knowledge of a DEITY, and swarms of inhuman religions have sprung up out of a sentiment so simple and so consolatory.

To the investigation of the divine harmonies of Nature I have devoted my life, and this work. If I have gone astray, at least my errors shall not be fatal to religion, the natural bond of mankind, and the hope of our sublime passions. Happy if I have been able sometimes to prop, with my feeble support, that sacred edifice, assailed, in these times, on every side! However bold some of my speculations may be, they have nothing to do with bad people; and I shall have the full recompense of my labour, if so much as one unfortunate wretch, ready to sink at the melancholy spectacle which the world presents, shall revive, on beholding in Nature a father, a friend, a rewarder.

The rich and the great imagine that every one is miserable, and out of the world, who does not live as they do; but they, living far from Nature, live out of the world. They would find thee, O eternal Beauty! always ancient, and always new; * O life, pure and blissful, of all those who truly live, if they sought thee only within themselves! But, thou being

* St. Augustin's City of God.

so much within themselves, where they never choose to look, and too magnificent externally, diffusing thyself through infinite space, thou remainest to them an unknown God.* In losing themselves, they have lost thee. The order, nay, the beauty, with which thou hast invested all thy creatures, to serve as so many steps by which man may raise himself to thee, are transformed into a veil, which conceals thee from his sickly eyes. Men have no sight but for vain shadows. The light dazzles them. Mere nothings are to them every thing ; and all-perfection passes for nothing. Nevertheless, he who never saw thee, has never seen any thing ; he who has no relish for thee, is an utter stranger to true pleasure ; he is as if he were not, and his whole life is only a miserable dream.

O my God ! give to these labours of a man, not the duration, or the spirit of life, but the freshness of the least of thy works ! Let their divine graces be transfused into my writings, and bring back a corrupted age to Thee ! Opposed to Thee, all power is weakness ; supported by Thee, weakness becomes irresistible strength. When the rude northern blasts have ravaged the earth, thou callest for the feeblest of winds ; at the sound of thy voice, the zephyr breathes, the verdure revives, the gentle primrose, and the humble violet, cover the bosom of the bleak rock with a mantle of gold and purple.

STUDY SECOND.

BENEFACTENCE OF NATURE.

MOST men, in policed nations, look on Nature with indifference. They are in the midst of her works, and admire only human grandeur. What charm can render the history of man so interesting ! It has to boast of vain objects of glory alone, of uncertain opinions, of bloody victories, or, at most, of useless labours. If Nature sometimes finds a place in it, we are called upon to observe only the ravages she has committed, and to hear her charged with a thousand calamities, which may be all traced up to our own imprudence.

With what unremitting attention, on the contrary, is this common mother providing for us the means of happiness ! She has diffused her benefits from pole to pole, in the view of engaging us to unite in a mutual communication of them. She recalls us from the prejudices which unhappily separate mankind, to the universal laws of justice and humanity, by frequently putting our ills in the hands of the so highly vaunted conquerors, and our pleasures in those of the oppressed, whom we hardly deign to favour with our pity.

When the princes of Europe issued forth with the Gospels in their hand, to ravage Asia, they brought back with them the pestilence, the leprosy, and small-pox ; but Nature pointed out to a dervise the coffee plant, and produced our plagues from our Croisades, and our delicious beverage from the cup of a Mahometan monk. The successors of these princes subjugated the American continent, and transmitted to us a succession of wars and venereal diseases. While they were exterminating its inoffensive inhabitants, a Caraib, in token of peace, set the sailors a smoking his calumet ; the perfume of tobacco dissipated their chagrin, and the use of it is disseminated over the universe.

To whom are we indebted for the use of sugar, of chocolate, of so many agreeable means of subsistence, and so many salutary medicines ? To naked Indians, to poor peasants, to wretched negroes. The spade of slaves has done more good than the sword of conquerors has done mischief. But in which of our great squares are we to look for the statues of our obscure benefactors ! Our histories have not vouchsafed to name them.

Where is now the time, when our forefathers wandered up and down, living on the precarious supplies of hunting, and not daring to trust to Nature ? Her simplest phenomena filled them with terror, and they trembled at sight of an eclipse. I will suppose, that a philosopher, such as Newton, were then to have treated them with the spectacle of some of our natural sciences, and shown them, with the microscope, forests in moss, mountains in grains of sand, thousands of animals in drops of water ; that afterwards, discovering to them, in the heavens, a progression of greatness equally infinite, he had shown them, in the planets, hardly perceptible to the naked eye, worlds much greater than ours, Saturn, three hundred millions of leagues distant ; in the fixed stars,

infinitely more remote, suns which probably illuminate other worlds; in the whiteness of the milky way, stars, that is suns, innumerable, scattered about in the heavens, as grains of dust on the earth, without man's knowing whether all this may not be more than the threshold of Creation merely; with what transports would they have viewed a spectacle which we, at this day, behold without emotion?

But I would rather suppose, that, unprovided with the magic of science, a man like Fenelon had presented himself to them, in all the majesty of virtue, and thus addressed the Druids: 'You frighten yourselves, my friends, with the groundless terrors which you instil into the people. God is righteous. He conveys to the wicked terrible apprehensions, which recoil on those who communicate them. But He speaks to all men in the blessings which He bestows. Your religion would govern men by fear; mine draws them with cords of love, and imitates his sun in the firmament, whom He causes to shine on the evil and on the good.' After this, that he had distributed among them the simple presents of Nature, till then unknown, sheaves of corn, slips of the vine, sheep clothed with the woolly fleece: Oh! what would have been the gratitude of our grandfathers! They would, perhaps, have fled with terror from the inventor of the telescope, mistaking him for a spirit; but, undoubtedly, they would have fallen down, and worshipped the author of *Telema- chus*.

These are only the smallest part of the blessings for which their opulent descendants stand indebted to Nature. An infinite number of arts are employed at home, to diffuse knowledge and delight; and there is not a spot of the earth, or sea, but what furnishes them with some article of enjoyment. Even the sands of Africa, where they have no game-keeper, send them in clouds, quails, and other birds of passage, which cross the sea in spring, to load their table in Autumn; and the northern pole, where they have no cruiser, pours on their shores, every summer, legions of mackarel, fresh cod, and turbot, fattened in the long nights of winter.

Not only the fowls and the fishes change for them their climate, but the very trees themselves. They have no longer occasion for suns: they can dispose of latitudes. They can convey, in their hot-houses, the heats of Syria to exotic plants, at the very season their hinds are perishing with the cold of

the Alps, in their hovels. Not only every thing that actually exists, but ages past, all contribute to their felicity

The sublime geniuses, of all ages and countries, celebrating, without concert, the undecaying lustre of virtue, and the providence of Heaven, in the punishment of vice, add the authority of their reason to the universal instinct of mankind, and multiply, in their favour, the hopes of another life, of long duration, and more exalted felicity. But it is from the very lap of plenteousness and pleasure, that the voice of murmuring against Providence now arises. From libraries, stored with so many sources of knowledge, issue forth the black clouds which have obscured the hopes and virtues of Europe.

STUDY THIRD.

OBJECTIONS AGAINST PROVIDENCE.

“THERE is no God,” say these self-constituted sages. “From the work form your judgment of the workman.* Observe, first of all, this globe of ours, so destitute of proportion and symmetry. Here it is deluged by vast seas ; there it is parched with thirst, and presents only wildernesses of barren sand. A centrifugal force, occasioned by its diurnal rotation, has heaved out its equator into enormous mountains, while it flattened the poles ; for the globe was originally in a state of softness ; whether it was a mud recovered from the empire of the waters, or, what is more probable, a scum detached from the sun. The volcanoes, which are scattered over the whole earth, demonstrate that the fire which formed it is still under our feet. Over this scoria, so wretchedly levelled, the rivers run as chance directs. Some of them inundate the plains ; others are swallowed up, or precipitate themselves in cataracts, and no one of them presents any thing like a regular current. The islands are merely fragments of the continent, violently separated from it by the ocean ; and what is the continent itself, but a mass of hardened clay ? Here, the unbridled deep devours its shores ; there, it deserts them, and exhibits new mountains, which had

* See replies to this objection in Study IV.

been formed in its womb. Amidst this conflict of contending elements, this baked lump grows harder and harder, colder and colder, every day. The ices of the poles, and of the lofty mountains, advance into the plains, and insensibly extend the uniformity of an eternal winter over this mass of confusion, ravaged by the winds, the fire, and the water.

‘In the vegetable world the disorder increases upon us.* Plants are a fortuitous production, of humid and dry, of hot and cold, the mould of the earth merely. The heat of the sun makes them spring up, the cold of the poles kills them. Their sap obeys the same mechanical laws with the liquid in the thermometer, and in capillary tubes. Dilated by heat, it ascends through the wood, and re-descends through the rind, following in its direction the vertical column of the air which impresses that direction. Hence it is that all vegetables rise perpendicularly, and that the inclined plane of a mountain can contain no more than the horizontal plane of its base, as may be demonstrated by geometry. Besides, the earth is an ill-assorted garden, which presents, almost every where, useless weeds, or mortal poisons.

‘As to the animals, which we know better, because they are brought nearer to us, by similar affections, and similar wants, they present still greater absurdities.† They proceeded at first from the expansive force of the earth, in the first ages of the world, and were formed out of the fermented mire of the ocean and of the Nile, as certain historians assure us; among others Herodotus, who had his information from the priests of Egypt. Most of them are out of all proportion. Some have enormous heads and bills, such as the toucan; others long necks and long legs, like the crane; these have no feet at all, those have them by hundreds; others have theirs disfigured by superfluous excrescences, such as the meaningless spurs of the hog, which, appended at the distance of some inches from his feet, can be of no service to him in walking.

‘There are animals scarcely capable of motion, and which come into the world in a paralytic state, such as the sloth or sluggard, who cannot make out fifty paces a day, and screams out lamentably as he goes.

‘Our cabinets of natural history are filled with monsters; bodies with two heads; heads with three eyes, sheep with

* The reply is in Study V.

† The reply is in Study VI.

six feet, &c. ; which demonstrate that Nature acts at random, and proposes to herself no determinate end, unless it be that of combining all possible forms : and, after all, this plan would denote an intention which its monotony disavows. Our painters will always imagine many more beings than can possibly be created. Add to all this the rage and fury which desolate every thing that breathes : the hawk devours the harmless dove in the face of heaven.

‘ But the discord which rages among animals is nothing, compared to that which consumes the human race.* First, several different species of men, scattered over the earth, demonstrate that they do not all proceed from the same original. There are some black, others white, red, copper-coloured, lead-coloured. There are some who have wool instead of hair ; others who have no beard. There are dwarfs and giants. Such are, in part, the varieties of the human species, every where equally odious to Nature. No where does she nourish him with perfect good will. He is the only sensible being laid under the necessity of cultivating the earth, in order to subsist : and, as if this unnatural mother were determined to persecute, with unrelenting severity, the child whom she has brought forth, insects devour the seed as he sows it, hurricanes sweep away his harvests, ferocious animals prey on his cattle, volcanoes and earthquakes destroy his cities ; and the pestilence which, from time to time, makes the circuit of the globe, threatens at length his utter extermination.

‘ He is indebted to his own hands for his intelligence, his morality is the creature of climate, his governments are founded in force, and his religion in fear. Cold gives him energy ; heat relaxes him. Warlike and free in the north, he is a coward and a slave between the tropics. His only natural laws are his passions. And what other laws should he look for ? If they sometimes lead him astray, is not Nature, who bestowed them upon him, an accomplice at least, in his criminality ? But he is made sensible of their impulse, only as a warning never to gratify them.

‘ The difficulty of finding subsistence, wars, imposts, prejudices, calumnies, implacable enemies, perfidious friends, treacherous females, four hundred sorts of bodily distempers,

* The reply is in Study VII.

those of the mind, both more cruel and more numerous, render him the most wretched of creatures that ever saw the light. It were much better that he had never been born. He is every where the victim of some tyrant. Other animals are furnished with the means of fighting, or at least of flying; but man has been tossed on the earth by chance, without an asylum, without claws, without fangs, without velocity, without instinct, and almost without a skin; and as if it were not enough for him to be persecuted by all nature, he is in a state of perpetual war with his own species. In vain would he try to defend himself from it. Virtue steps in, and binds his hands, that Vice, in safety, may cut his throat. He has no choice but to suffer, and to be silent.

‘What, after all, is this virtue, about which such parade is made? A combination of his imbecility; a result of his temperament. With what illusions is she fed? Absurd opinions, founded merely on the sophisms of designing men, who have acquired a supreme power by recommending humility, and immense riches by preaching up poverty. Every thing expires with us. From experience of the past, let us form a judgment of the future; we were nothing before our birth; we shall be nothing after death. The hope of our virtues is a mere human invention, and the instinct of our passions is of divine institution.

‘But there is no God.* If there were, He would be unjust. What being, of unlimited power and goodness, would have exposed to so many ills the existence of his creatures; and laid it down as a law, that the life of some could be supported only by the death of others? So much disorder is a proof that there is no God. It is fear that formed him. How must the world have been astonished at such a metaphysical idea, when man first, under the influence of terror, thought proper to cry out that there was a God! What could have made him God? Why should he be God? What pleasure could he take in that perpetual circle of woes, of regenerations, and of death?†

* The reply is in Study VIII.

† The refutation of these objections, all of them resolved directly or indirectly will be found by the numeral characters, which correspond to each particular Study.

STUDY FOURTH.

REPLIES TO THE OBJECTIONS AGAINST PROVIDENCE.

SUCH are the principal objections raised against a Providence, which no one will accuse me of having stated too feebly. Did these murmurings proceed from some wretched mariner, or some oppressed peasant, my astonishment would be less: but it is amidst the luxury of Greece and Rome, in the bosom of the wealth of Indostan, of the pomp of Persia, of the voluptuousness of China, of the overflowing abundance of European capitals, that men first started up who dared to deny the existence of a DEITY. On the contrary, the houseless Tartars; the savages of America, continually pressed with famine; the Negroes, without foresight, and without a police; the inhabitants of the rude climates of the north, such as the Laplanders, the Greenlanders, the Esquimaux, see gods every where, even in a flint, in a pebble.

✕ In all countries the poor rise early, labour the ground, live in the open air, and in the fields. They believe, from a sentiment natural to weak minds, that the objects of their religious worship will be at their disposal in proportion as they are within their reach. Hence it is that the devotions of the common people, in every country, are presented in the fields, and have natural objects for their centre. It always attracts the religion of the peasantry. A hermitage on the side of a mountain, a chapel at the source of a stream, an image of the Virgin in wood, niched in the trunk of an oak, have, to them, a much more powerful attraction than the gilded altars of our cathedrals.

The principal religious acts of the people in Turkey, Persia, the Indies, and China, are pilgrimages in the fields. The rich, on the contrary, prevented in all their wants and wishes by men, no longer look up to God for any thing. Their whole life is passed within doors, where they see only the productions of human industry, and insensibly lose sight of those of Nature. They fail not to interpret her sublime operations by the mechanism of the arts most familiar to them. Hence so many systems, which enable you to guess at the occupation of their authors. Epicurus framed his world and

his atoms, with which Providence has nothing to do, out of his own apathy; the geometrician forms it with his compasses; the chymist compounds it of salts; the mineralist extracts it from the fire; and they who apply themselves to nothing, suppose it, like themselves, in a state of chaos, and moving at random. Thus, the corruption of the heart is the original source of our errors.

Replies to the Objections against Providence, founded on the Disorders of the Globe.

Though ignorant of the means employed by Nature in the government of the world, it is sufficient to glance on a geographical chart, and to have read a little, to be enabled to demonstrate that those by which her operations are pretendedly explained to us, have no foundation in truth. From human insufficiency spring the objections levelled at the Divine Providence.

It appears to me no more natural to compose the uniform motion of the earth through the heavens, of the two motions of projection and attraction, than to attribute to similar causes that of a man walking on the earth. The centrifugal and centripetal forces seem no more to exist in the heavens, than the two circles denominated the equator and the zodiac. However ingenious these hypotheses may be, they are only scaffoldings imagined by men of genius for rearing the fabric of science, but which no more assist us in penetrating into the sanctuary of Nature, than those employed in the construction of our churches can introduce us into the sanctuary of religion. If a centrifugal force had swelled the mountains of the globe, in a state of fusion, there must have been mountains much more elevated than the Andes of Peru and Chili. That of Chimborazo, the highest of them, is only 3220 or 3350 fathoms. This elevation, nearly the greatest known on earth, is less perceptible on it than the third part of a line would be on a globe of six feet diameter. Now, a mass of melted metal presents, in proportion to its size, scoriæ much more considerable. Look at the anfractuosities of a simple morsel of iron-dross. What frightful swellings, then, must have been formed on a globe of heterogeneous and fermenting materials, more than 3000 leagues thick? The moon, whose

diameter is much less considerable, contains, according to Cassini, mountains three leagues high. But what would be the case if, with the action of the heterogeneousness of our terrestrial materials, all in fusion, we should besides suppose that of a centrifugal force, produced by the earth's rotatory motion round its axis? I imagine that this force must have been necessarily exerted in the direction of its equator, and instead of forming it into a globe, must have flattened it out in the heavens, like those large plates of glass which glass-blowers expand with their breath.

Not only the diameter of the earth, at the equator, is no greater than under its meridians, but the mountains there are not more elevated than elsewhere. The noted Andes of Peru commence several degrees southward of the equator, and coasting along Peru, Chili, and Magellan's Land, stop at the 55th degree of southern latitude, in the Terra del Fuego, where they present to the ocean a promontory of ice, of a prodigious height. Through the whole extent of this immense track, they never open but at the Straits of Magellan, forming throughout a rampart fortified with pyramids of ice, inaccessible to men, to quadrupeds, and even to birds.

The mountains on the isthmus of Panama, on the contrary, placed nearly under the line, have but a trifling elevation, compared with the Andes. The highest mountains of Asia are without the tropic. The chain of Taurus and Imaus, commences in Africa, at Mount Atlas, toward the 30th degree of northern latitude. It runs across Africa and Asia, between the 38th and 40th degrees of northern latitude, having its summit mostly covered with snows that never melt; a proof of considerable elevation. Mount Ararat, a part of this chain, is perhaps, more elevated than any mountain of the New World: and the Peak of Teneriffe is visible 40 leagues off. The Felices of Norway, called also the Alps of the North, are visible at sea 50 leagues distant; and are said to be 3000 fathoms high.

But if the pretended centrifugal force once had the power of heaving up mountains, why does it not possess, at this day, the power of tossing up a straw into the air? It ought not to leave a single detached body on the surface of the earth. They are affixed to it, I shall be told, by the centripetal force, or gravity. But if this last power, in fact, forces every body toward it, why have not the mountains too submitted to this

universal law, when they were in a state of fusion? I cannot conceive what reply can be made to this twofold objection.

The sea appears not more adapted to the formation of mountains, than the centrifugal force is. How is it possible to imagine the possibility of its having thrown them out of its womb? In vain would we ascribe to it revolutions from west to east; never will it have the power of raising any thing above its level. If certain parts of the Mediterranean are produced as instances, which the sea has actually left dry, it is no less certain, that there is a much greater number, on the same coasts, which the water has not deserted. The ports of Marseilles, Carthage, Malta, Rhodes, Cadiz, and many others, are still frequented by navigators, as they were in the remotest antiquity. The Mediterranean could not have sunk at any one point of its shores, without sinking at every other, for water in the bason always comes to its level. This reasoning may be extended to all the coasts of the ocean. If there are found any where tracks of land abandoned, it is not because the sea retires, but because the earth is gaining ground. This is the effect of alluvions occasioned frequently by the overflowing of rivers, and sometimes by the ill-advised labours of man. The encroachments of the sea on the land are equally local, and are the effects of earthquakes, which can be extended to no great distance. As these reciprocal invasions of the two elements are particular, and frequently in opposition on the same coasts, which have, in other respects, constantly preserved their ancient level, it is impossible to deduce from them any general law for the movements of the ocean.

To account for the origin of marine fossils extracted from the bed of the sea, naturalists suppose a primitive earth whose height equalled that of the present elevation of the highest peaks of the Andes, &c. which remain so many evidences of the existence of that primeval soil: after this, they employ snows, rains, winds, and I know not what besides, to lower this original continent to the brink of the sea; so that we inhabit only the bottom of this enormous quagmire. This idea has an imposing air; first, because it terrifies; and then, because it is conformable to that picture of apparent ruin which the globe presents; but it vanishes away before this simple question. What has become of the earth and the rocks of this tremendous riddance? If it is said, They have

been thrown into the sea ; we must suppose, prior to all degradation, the existence of the bed of the sea, and its excavation would then present a great many other difficulties. But let us admit it. How comes it that those ruins have not, in part, accumulated ? Why has not the sea overflowed ? How can it have happened, on the contrary, that it should have deserted such immense tracts of land, as are sufficient to form the greatest part of two vast continents ! Our systems, therefore, cannot account for the steepy elevation of mountains of granite, by any kind of degradation, because they know not how to dispose of the fragments ; nor for the formation of calcareous mountains, by the movements of the ocean, because in its actual state it is incapable of covering them.

Bays, gulfs, and mediterranean seas, are no more the effects of irruptions of the ocean into the land, than mountains are productions of the centrifugal motion. These pretended disorders are necessary to the harmony of all parts of the earth. Let us suppose, for example, that the Straits of Gibraltar were closed, as it has been said was formerly the case, and that the Mediterranean existed no longer. What would become of so many rivers of Europe, Asia, and Africa, which are kept flowing by the vapours which ascend out of that sea, and bring back their waters to it, in a wonderful exactness of proportion, as the calculations of many ingenious men have demonstrated ? The north winds, which refresh Egypt in summer, and convey the emanations of the Mediterranean to supply the sources of the Nile, blowing, in this case, over a space destitute of water, would carry drought and barrenness over all the northern regions of Africa, and even into the interior of that continent.

The southern parts of Europe would fare still worse ; for the hot and parching winds of Africa, loaded with rainy clouds as they cross the Mediterranean, now blowing over the dry bed of that sea, without tempering the heat by humidity, would blast all that vast region of Europe, extending from Gibraltar to the Euxine Sea, and utterly dry up all the countries through which, at present, flow a multitude of rivers, such as the Rhone, the Po, the Danube, and the rest. It is not sufficient to suppose, that the ocean forced a passage into the bed of the Mediterranean ; it must be imagined the tract of land inundated was ^{ever} ~~ever~~ ^{more} than the ocean, a phenomenon

no where to be met with, those parts excepted which have been wrested from the deep by human industry, as in Holland. A lateral sinking of the earth must also have taken place all round the bason of the Mediterranean, to regulate the circuits, declivities, canals, and windings of so many rivers, which come from such a distance to empty themselves into it, and this sinking must have been effected with admirable proportions.

It is not, then, to an irruption of the ocean that we are to ascribe the Mediterranean, but to an excavation of the globe, executed with dispositions so happy and so favourable to the circulation of so many lateral rivers, that were I to trace the course of any single one, it would be evident how destitute of all foundation the supposition is which I am combating. Indeed, if these interior waters did not exist, not a fountain would remain in the greatest part of the habitable globe.

Nature, in forming basons to receive the seas, neither rounded the borders, nor applied the line to them; but contrived deep bays, sheltered from the general currents of the ocean, that, during stormy weather, the rivers might discharge themselves into it in security, and that the finny legions might resort thither, for refuge, at all seasons. She has employed similar dispositions in forming the beds of rivers; making their currents flow, not in a straight line, agreeably to the laws of hydraulics, but to wind about for a long time through the bosom of the land, before they pour themselves into the sea.

In order to regulate the course of those rivers, and to accelerate or retard it, conformably to the level of the countries through which they flow, she pours into them lateral rivers, which accelerate it in a flat country, when they form an acute angle with the source of the main river; or retard it in a mountainous country, by forming a right, and sometimes an obtuse angle, with the source of the principal stream. Rivers also, on throwing themselves into the sea, produce, in their turn, by the direction of their mouths, acceleration or retardation in the course of the tides; and these facts will doubtless convince the candid reader, that the bed of the seas was scooped out expressly for the purpose of receiving them.

To remove every possibility of doubt on the subject, it must be observed, that by a sinking down of the solid parts

of the globe, the shores of the sea, under water, would have the same declivities with the adjoining continent ; but this is not found to be the case on any coast whatever. The declivity of the bason of the sea is much steeper than that of the bounding lands,* and by no means a prolongation of it. Paris, for example, is raised above the level of the sea about 26 fathoms, reckoning from the base of the bridge of Notre-Dame. The Seine, accordingly, from this point to where it empties itself into the sea, has a declivity of little more than 130 feet, in a distance of 40 leagues ; whereas, measuring from the mouth of the river, out into the sea, only a league and a half, you find, at once, an inclination of from 60 to 80 fathoms, the depth at which vessels anchor, in the road of Havre-de-Grace.

< The declivity of the excavations of the bed of the sea has been regulated by laws infinitely wise : for were it the same with that of the adjacent lands, the billows of the sea, whenever the wind blew toward the shore, would considerably encroach on the land. This actually happens in the case of storms and extraordinary tides, when the waves overflow their usual bounds. Holland is exposed to inundations, because it has encroached on the bed of the sea.

It is principally on the shores of the ocean that the invisible boundary is fixed, which the AUTHOR of Nature has prescribed to its waves. It is there you are at the intersection of two different planes, the one of which terminates the declivity of the land, and the other commences that of the sea.

It cannot be alleged, that it was by currents of the sea the bed was hollowed out ; for where could the earth that filled it before be deposited ? They could raise nothing above their own level. It cannot even be alleged that the channels of rivers have been excavated by the current of their own streams, for several have found a subterraneous passage through masses of solid rock. Besides, on the supposition which we are examining, these rivers must have formed, at the place of their falling into the ocean, banks of sand, accumulations of earthy substances, proportional to the quantity of ground cleared away in forming their channels. Most of them, on the contrary, empty themselves at the bottom of bays, hollowed out expressly for receiving them.

How is it that they have not completely filled up those bays, as they are incessantly hurling down into them sub-

stances separated from the land? Why is not the very bed of the ocean choked up, from the constant accumulation of the spoils of vegetables, sands, rocks, and the wreck of earth, which, on every shower that falls, tinge with yellow the rivers which fall into it? The waters of the ocean have not risen a single inch since man began to make observations, as might easily be demonstrated from the state of the most ancient sea-ports of the globe, which are still, for the most part, at the same level.

The means employed by Nature for the construction, support, and purification, of this immense bason, would suggest fresh subject of admiration: but enough has been said to prove, that what in nature may appear the effect of ruin, or chance, is, in many cases, the result of intelligence the most profound. Not only no hair falls from our head, and no sparrow from heaven to the ground, but not a pebble rolls on the shore of the ocean, without the permission of God.

Independent of geographical proofs without number, which demonstrate that the ocean, by its irruptions, has not hollowed out one single bay on the globe, nor detached any one part of the continent from the rest, many may be deduced from the vegetable and animal kingdoms, and from man. I shall just quote an observation from the vegetable world, which proves that Britain never was united to the European continent, but from the beginning separated by the channel. Cæsar, in his Commentaries, says, that during his stay in that island, he had never seen either the beech tree or the fir; though they were very common in Gaul, along the banks of the Seine and Rhine. If, therefore, these rivers had ever flowed through any part of Britain, they must have carried with them the seeds of the vegetables which grew at their sources, or upon their banks. The beech and the fir, which at this day thrive exceedingly well in Britain, must, of necessity, have been found growing there in the time of Julius Cæsar. Besides, from whence could the Seine, the Rhine, the Thames, and so many other rivers, whose currents are supplied from the Channel, have been fed with water? The Thames, then, must have flowed through France, or the Seine through England; or, to speak more conformably to truth and nature, the countries now watered by these rivers would have been completely dry.

By our geographical charts, as by most other instruments

of science, we are misled. Observing in these so many retreating and projections along the coasts of the continent, we imagine these irregularities must have been occasioned by violent currents of the sea. It has just been demonstrated that this effect *was* not thus produced ; I now proceed to show that it *could not possibly* have been the case.

The English navigator Dampier says : ‘ Bays scarcely have any currents, or if there be such a thing, they are only counter-currents running from one point to another.’* He quotes many observations in proof of this, and many others, of a similar nature, may be found in the journals of navigators. Though he has treated only of the currents between the tropics, we shall generalize this principle, and apply it to the principal bays of continents.

I reduce to two general currents those of the ocean. Both proceed from the poles, and are produced, in my opinion, by the alternate fusion of the ices. This appears so natural, so new, and of such curious investigation, that the reader, I flatter myself, will not be angry with me if I give him an idea of it.

The poles are the sources of the sea, as the icy mountains are those of the principal rivers. The snow and the ice which cover our pole, annually renovate the waters of the sea, comprehended between our continent and that of America, the projecting and retreating parts of which have, besides, a mutual correspondence, like the banks of a river.

It may be remarked, at first sight, on a map of the world, that the bed of the Atlantic Ocean becomes narrower toward the north, and widens toward the south ; and that the prominent part of Africa corresponds to that great retreating part of America, at the bottom of which is the Gulf of Mexico ; as the prominent part of South America corresponds to the vast Gulf of Guinea ; so that this bason has, in its configuration, the proportions, the sinuosities, the source, and the mouth, of a vast fluviatic channel.

Let us now observe, that the ices and snows form, in the month of January, on our hemisphere, a cupola, the arch of which extends more than 2000 leagues over the two continents, with a thickness of some lines in Spain, some inches in France, several feet in Germany, several fathoms in Russia, and of some hundreds of feet beyond the 60th degree of lati-

* Treatise on Winds and Tides, vol. ii. page 385.

tude, such as the ices which Henry Ellis,* and other navigators of the north, encountered there at sea, even in the midst of summer, some of which were from 15 to 1800 feet above its level ; for their elevation must probably go on increasing, up to the very pole, in conformity to the proportions observable in those which cover the summits of our icy mountains ; and this must give them, under the pole itself, a height which there is no possibility of determining.

From this simple outline is perceptible what an enormous aggregation of water is fixed by the cold of winter, in our hemisphere, above the level of the ocean. I think myself warranted to ascribe to the periodical fusion of this ice, the general movement of our ocean, and that of the tides. We may apply, in like manner, the effects of the fusion of the ices of the south pole, which are there still more enormous, to the movements of its ocean.

No conclusion has, hitherto, been drawn, relative to the movements of the sea, from the two masses of ice so considerable, alternately accumulated and dissolved at the two poles of the world. They must, however, occasion a very perceptible augmentation of its waters, on their return to it, by the action of the sun, which partly melts them once every year ; and a great diminution, on being withdrawn, by the effect of the evaporations, which reduce them to ice at the poles, when the sun retires. I shall now deduce, from the alternate dissolution of the polar ices, the general movements of the seas, hitherto ascribed to gravitation, or to the attraction of the sun and moon on the equator.

It is impossible to deny that the currents and the tides come from the pole, in the vicinity of the polar circle.

Frederick Martens, who, in his voyage to Spitzbergen, in 1671, advanced to the 81st degree of northern latitude, positively asserts, that the currents, amidst the ices, set in toward the south. He adds, farther, that he can affirm nothing with certainty respecting the flux and the reflux of the tides. Let this be carefully remarked.

Henry Ellis observed with astonishment, in his voyage to Hudson's Bay, in 1746 and 1747, that the tides there came from the north, and were accelerated, as the latitude increased. He assures us that these effects, so contrary to their effects

* Ellis's Voyage to Hudson's Bay.

on our coasts, where they come from the south, demonstrate that the tides, in those high latitudes, do not come from the line, nor from the Atlantic Ocean. He ascribes them to a pretended communication between Hudson's Bay, and the South Sea; a communication he with much ardour sought for, and indeed was the object of his voyage; but now we have complete assurance that it does not exist, from the fruitless attempts lately made by Captain Cook to find it by the South Sea, to the north of California. Ellis further observed, that the course of these northern tides of America was so violent at Wager's Strait, about $65^{\circ} 37'$ north latitude, that it ran at the rate of from eight to ten leagues an hour. He compares it to the sluice of a mill. He remarked that the surface of the water was there very fresh, which puzzled him exceedingly, by damping his hope of a communication between this bay and the South Seas. John Huguez de Linschoten, a Dutchman, corroborates these remarks on the currents of the northern tides of Europe,* and his compatriot, the unfortunate William Barents,† who ended his days on the northern coasts of Nova Zembla, found, north and south of that island, a perpetual current of ice, setting in from the east, with a rapidity, which he compares, as Ellis does, to a sluice. He found there some Russian fishermen from Petzora, who made presents of fat geese to the Dutch mariners, with strong demonstrations of friendship; for calamity has, in all climates, a powerful tendency to conciliate affection between man and man.

These effects, then, can proceed only from the effusions of the ices which surround the pole. The ices, flowing with such rapidity to the north of America and of Europe, towards July and August, greatly contribute to our high equinoctial tides, in September; and when their effusions are stopped in October, then our tides begin to diminish.

I shall now proceed to demonstrate, that there is no one tide, on any coast whatever, but what owes its origin to polar effusions. An observation of Dampier's‡ will serve as a basis to my reasonings. That careful and ingenious observer dis-

* See the first and second Voyages to Waigats, by H. J. Linschoten, *Voyages to the North*, vol. iv. page 204.

† Consult the second and third Voyages of the Dutch by the north, in the first volume of the *Voyages of the East India Company*.

‡ Dampier on Winds and Tides.

tinguishes between currents and tides. He lays it down as a principle, that *currents are scarcely ever felt but at sea, and tides upon the coasts*. This being admitted, the polar effusions, which are the tides of the north and east to those who are in the vicinity of the poles or bays having a communication with it, take their general course to the middle of the Atlantic channel, attracted toward the line by the diminution of the waters, which the sun is there incessantly evaporating. They produce, by their general current, two contrary currents, or collateral whirlpools, similar to those which rivers produce on their banks.

I am not taking for granted, without any foundation, the existence of the counter-currents, or *vortices*. These *vortices* are hydraulic reactions, the laws of which geometry explains, and the reality of which is completely ascertained by experience. If you look at a small running book, you will frequently see straws floating along the brink, and carried upward in a direction opposite to the general current of the stream ; on arriving at the points, where the counter-currents cross the general, you observe them agitated by these two opposed powers, turning and spinning round a considerable time, till they are at last carried down the general current.

These counter-currents are still more perceptible, when such a rivulet flows through a bason which has itself no flux ; for the reaction is, in that case, so considerable round the whole circumference of the bason, that the counter-currents carry about all bodies floating in it, to the very place where the river disengages itself.

These lateral counter-currents are so perceptible on the banks of rivers, that the watermen frequently take the advantage of them, to make their way in the direction opposite to the general course. They are still more decidedly remarkable on the banks of lakes. Father Charlevoix supposes, and with good reason, that the rivers which throw themselves into Lake Michigan, produce, in the middle of its waters, strong contrary currents : ' But these strong currents,' says he, * ' are perceptible only in the middle of the channel, and produce on the banks *vortices*, or counter-currents, of which those avail themselves who have to coast along the shore, as is the case with persons who are obliged to take the water in canoes make of bark.'

* Charlevoix, History of New France, vol. vi. page 2.

Dampier's work is filled with observations on counter-currents of the ocean ; but as I believe he did not even suspect the existence of its general current, though he has thoroughly investigated the two currents, or monsoons of the Indian Ocean, I shall proceed to adduce certain facts, which establish the most perfect conformity between the Atlantic current and those which he observed in the Indian Ocean and South Seas.

These facts will further prove to a demonstration, the existence of those polar effusions : for, wherever those effusions meet, in their progress southward, their own counter-currents setting in toward the north, they produce, by their collision, tremendous tides, whose direction is diametrically opposite.

Let us consider them only at their point of departure toward the north of Europe, where they begin to leave our coasts, and stretch out into the open sea. Pont Oppidan says, in his History of Norway, that there is above Bergen a place called Maelstrom, where the sea forms a prodigious *vortex*, in which many vessels have been swallowed up. James Beverell* says positively, that in the Orkney islands are two opposite tides, one running from the north-west, the other from the south-east ; that they dash their roaring billows up to the clouds, and convert the separating strait into an enormous mass of foam. The Orkneys lie a little under the latitude of Bergen, that is, at the confluence of the polar effusions and of their counter-currents.

Other islands of the sea are in similar positions. The channel of Bahama, for example, which runs so rapidly north, between the continent of America and the Lucayo islands, produces, by its encountering the general current of that sea, tides similar to those of the Orkneys. These counter-currents to the course of the Atlantic Ocean, produce, then, our European and American tides, which set in to the north on the coast, while its general current runs southward, at least in the summer time.

I shall adduce another instance, which from its importance and authenticity will be sufficient for my purpose. Christopher Columbus sailed from the Canaries about the beginning of September, and steered west. He found, at first, the currents carried him north-east. When he had advanced two

* See James Beverell, *Beauties of Scotland*, vol. vii. p. 1405

or three hundred leagues from land, he perceived their direction was southward. This terrified his companions, who believed that the sea was there driving to a precipice. Finally, as he approached the Lucayo islands, he again found the currents setting in northward. The journal of this important voyage may be found in Herrera.

My opinion is, that this general current which flows from our pole, in summer, with so much rapidity, and is so violent towards its source, according to the experience of Ellis and Linschoten, crosses the equinoctial line, as its flux is not stemmed by the effusions of the south pole, which, at that season, are consolidated into ice. I presume, for the same reason, that it extends beyond the Cape of Good Hope, thence directed to the torrid zone, from which it is attracted by the diminution of the waters, which the sun is there incessantly pumping up; that being directed eastward, by the position of Africa and Asia, it forces the Indian Ocean into the same direction, contrary to its usual motion. I consider it, therefore, as the prime mover of the westerly monsoon, which takes place in the seas of India, in April, and continues till September.

I am likewise of opinion, that the general current which issues, during our winter, from the south pole, then heated by the rays of the sun, restores the Indian Ocean to its natural motion westward, which is besides determined, on this side, by the easterly winds of the torrid zone, when nothing deranges their course. I farther presume, that this current, in its motion northward, by the position of America, produces various other changes in our tides.

It now appears possible to explain the principal phenomena of our tides, from these polar effusions. It will be evident why those of the evening should be stronger, in summer, than those of the morning; because the sun acts more powerfully by day than night, on the ices of the pole, on the same meridian with ourselves. It will farther be evident, how our morning tides, in winter, rise higher than those of the evening; and why the order of our tides changes every six months, as Bouguer* has well remarked; because the sun being alternately toward both poles, the effects of the tides must necessarily be opposite, like the causes which produce them.

* Bouguer, Treatise of Navigation, page 153.

But I beg leave to suggest harmonies between the ocean and the poles still more extensive and striking. At the solstices the tides are lower than at any other season of the year ; and these, likewise, are the seasons when there is most ice on the two poles, consequently least water in the sea. The reason is obvious. The winter solstice is, with respect to us, the season of the greatest cold ; there is, accordingly, at that time, on our pole and hemisphere, the greatest possible accumulation of ice. It is, indeed, at the south pole, the summer solstice ; but there is little ice melted on this pole, because the greatest heat is not felt there, as with us, but when the earth has an acquired heat, superadded to the actual heat of the sun, which takes place only in the six weeks that follow the summer solstice ; and these give us, likewise, in our summer, the hottest season of the year, which we call the dog-days.

At the equinoxes, on the contrary, we have the highest tides. And these are precisely the seasons when there is least ice at the two poles, of course the greatest mass of water in the ocean. At our autumnal equinox, in September, the greatest part of the ices of the north pole, which has undergone all the heats of summer, is melted, and those of the south pole begin to dissolve. It is farther remarkable, that the tides at our vernal equinox, in March, rise higher than those of September, because it is the end of summer to the south pole, which contains much more ice than ours, and consequently sends to the ocean a much greater mass of water. And it contains more ice, because the sun is six days less in that hemisphere than in ours. If I am asked, Why the sun does not communicate his light and heat, in exactly equal proportions, to both poles ? I shall leave it to the learned to assign the *cause*, but shall ascribe the *reason* of it to the Divine Goodness, which has bestowed the larger share of these blessings on that half of the globe containing the greatest quantity of dry land, and the greatest number of inhabitants.

Admitting, therefore, these alternate effusions of the polar ices, which it is impossible to call in question, and with the greatest facility all the phenomena of the tides and currents of the ocean will be explained. These phenomena present, in the journals of the most enlightened navigators, a perpetual obscurity, and a multitude of contradictions, as often as they

persist in ascribing the causes of them to the constant pressure of the moon and sun on the equator, without paying attention to the alternate currents from the poles, which direct their course to the equator ; to their counter-currents, which, returning toward the poles, produce tides ; and to the revolutions which winter and summer effect on these two movements.

It has been supposed indeed in modern times, that the sea must be clear of ice under the poles, and this is founded on the groundless assertion, that the sea freezes only along the shore ; but this supposition is the creature of men in their closets, in contradiction to the experience of the most celebrated navigators. The efforts of Captain Cook, toward the south, demonstrate its erroneousness. That intrepid mariner, in the month of February, the dog-days of the southern hemisphere, never could approach nearer to that pole, where there is no land, than the 70th degree of latitude, that is, than 500 leagues, though he had coasted round its cupola of ice for a whole summer ; besides, this distance did not compass half the magnitude of the cupola, for he was permitted to advance so far only under favour of a bay, opened in a part of its circumference, every where else of much greater extent.

These bays, or openings, are formed in the ice, merely by the influence of the nearest adjacent lands, where Nature has distributed sandy zones, to assist in accelerating the fusion of the polar ices, at the proper season. The winds, in summer, convey the igneous particles of those zones toward the poles, where they accelerate the action of the sun upon the ices ; it being easy to conceive, independent of experience, that the sands multiply the heat of the sun, by the reflection of their specular and brilliant parts, and preserve it a long time in their interstices.

+ There can remain, therefore, no doubt that the poles are covered with a cupola of ice, conformably to the experience of navigators, and the dictates of natural reason. We have taken a glance of the icy dome of our own pole, which covers it, in winter, to an extent of more than 2000 leagues over the continents. It is not so easy to determine its elevation at the centre, and under the very pole ; but the height must be immense.

+ The detached masses, half melted, torn every year from the circumference of this cupola, and met with at sea, pro-

digiously distant from the pole, about the 55th degree of latitude, are of such an elevation, that Ellis, Cook, Martens, and other navigators, the most accurate in their details, represent them at least as lofty as a ship under sail; nay, Ellis assigns to them an elevation of from 1500 to 1800 feet. They are unanimous in affirming, that these vast fragments emit coruscations, which render them perceptible before they come to the horizon. I shall remark, that the *aurora borealis*, or northern light, may probably owe its origin to similar reflections from the polar ices, the elevation of which may one day be determined by the extent of those very lights.

The ices in question are more than half melted before they reach the banks of Newfoundland; for they scarcely go any farther. It is the summer's heat which detaches them from the north, and they are carried toward the line by the current, where they arrive in a state of dissolution, to replace the waters which the sun evaporates in the torrid zone. These polar ices, of which our mariners see only the borders and the crumbs, must have, at their centre, an elevation proportioned to their extent. [I therefore consider the two hemispheres of the earth as two mountains with their bases applied to each other at the line, the poles as their icy summits, and the seas as rivers flowing from those summits.

If, then, we consider the proportions which the glaciers of Switzerland have to their mountains, and the rivers which flow from them, we shall be able to form some faint idea of those proportions which the glaciers of the poles bear to the globe, and the ocean. The Cordilleras of Peru, only mole-hills compared to the two hemispheres, and their rivers only rills of water compared to the sea, have selvages of ice, from 20 to 30 leagues broad, bristled, at their centre, with pyramids of snow from 12 to 1500 fathoms high. What then must be the elevation of these two domes of polar ice, which have, in winter, bases of 2000 leagues in diameter! I can have no doubt, that their thickness at the poles must have represented the earth as oval, in central eclipses of the moon, conformably to the observations of Kepler and Tycho Brahe.

From this configuration I deduce another consequence. If the elevation of the polar ices is capable of changing in the heavens the apparent form of the globe, their weight must be sufficiently considerable to produce some influence on its motion in the ecliptic. There is, in fact, a very singular

correspondence between the movement, by which the earth alternately presents its two poles to the sun, in one year, and the alternate effusions of the polar ices, which take place in the course of the same year. Let me endeavour to explain my conception of the way in which this motion of the earth is the effect of these effusions.

Admitting, with astronomers, the laws of attraction among the heavenly bodies, the earth must certainly present to the sun, which attracts it, the weightiest part of its globe. Now this weightiest part must be one of its poles, surcharged with a cupola of ice, of an extent of 2000 leagues, and of an elevation superior to that of the continents. But as the ice of this pole, which its gravity inclines toward the sun, melts in proportion to its vertical approximation to the source of heat, and as the ice of the opposite pole increases in proportion to its removal, consequently the first pole becoming lighter, and the second heavier, the centre of gravity passes alternately from the one to the other, and from this reciprocal preponderancy must ensue that motion of the globe in the ecliptic which produces our summer and winter.

From this alternate preponderancy, our hemisphere, containing more land than the southern, and consequently heavier, must incline longer toward the sun; this too corresponds to the matter of fact, for our summer is five or six days longer than our winter. A farther consequence is, that our pole cannot lose its centre of gravity, till the opposite pole becomes loaded with a weight of ice superior to the gravity of our continent, and of the ices of our hemisphere; this, likewise, is agreeable to fact, the ices of the south pole being more elevated and extensive than those of the northern; for mariners have not been able to penetrate farther than to the 70th degree of south latitude, whereas they have advanced no less than to 82 degrees north.

Here we have a glimpse of the reasons that determined Nature to divide this globe into two hemispheres, the one to contain the most dry land, the other the greatest quantity of water; so that this movement of the globe should possess consistency and versatility. It is farther evident why the south pole is placed immediately in the midst of the seas, far from any land; that it might load itself with a greater mass of marine evaporations, and that these, accumulated into ice around it, might balance the weight of the continents of our hemisphere.

Here I lay my account with being opposed by this very formidable objection. If the polar effusions occasion the earth's motion in the ecliptic, the moment would come in which, its two poles being in equilibrio, it could present to the sun the equator.

To this difficulty I reply, that we must have recourse to an immediate will of the AUTHOR of Nature, who is pleased to destroy the instant of this equilibrium, and who re-establishes the balancing of the earth on its poles, by laws to us unknown. This concession, however, no more weakens the probability of the hydraulic cause, which I apply to it, than that of the principle of the attraction of the heavenly bodies, which attempts to explain it, I am bold to say, with much less clearness. This very attraction would soon deprive the earth of motion, if it acted on the stars only. If we would be sincere, it is in the acknowledgment of an intelligence, superior to our own, that all the mechanical causes of our most ingenious systems must issue. The will of God is the *ultimatum* of all human knowledge.

From this objection I shall deduce consequences, diffusing new light on the ancient effects of polar effusions, and the manner in which they might have produced the deluge.

On the supposition then of the re-establishment of the equilibrium between the poles, and the earth's constantly presenting its equator to the sun, it is extremely probable that it would be set on fire. In fact, on this hypothesis, the waters under the equator being evaporated by the sun, would become irrevocably fixed in ice at the poles, receiving without effect the influence of that luminary, to them constantly in the horizon. The continents being thus dried up, under the torrid zone, and inflamed by an increasing heat, would quickly catch fire. Now, if it be probable that the earth would perish by fire, were the sun's motion confined to the equator, it is no less probable, that it must be deluged with water, if the course of the sun were in the direction of the meridian. Opposite means produce contrary effects.

We have just seen, that the alternate effusions of part of the polar ices only are sufficient for renewing the waters of the ocean, for producing the phenomena of the tides, and effecting the balancing of the earth in the ecliptic. We believe them capable of entirely inundating the globe, were the fusion to take place all at once. Let it but be remarked, that

the effusion of only a part of the ices of the Cordilleras in Peru, produces an annual overflow of the Amazon, the Orinoco, and several other great rivers of the New World, and inundates a great part of Brazil, Guiana, and the Terra Firma of America; that the melting of part of the snows on the Mountains of the Moon in Africa, occasions every year the inundations of Senegal, contributes to those of the Nile, and overflows vast tracks of country in Guinea, and all Lower Egypt; and that similar effects are annually reproduced in a part of southern Asia, in the kingdoms of Bengal, Siam, Pegu, and Cochin-China, and in the districts watered by the Tigris, the Euphrates, and many other rivers of Asia, which have their sources in chains of mountains perpetually covered with ice, namely, Taurus and Imaus: and who can doubt, that the total fusion of the ices of both poles, would swell the ocean above every barrier, and completely inundate the two continents?

For my own part, if I may venture to declare my opinion, ~~X~~ I ascribe the general deluge to a total effusion of the polar ices, the ices of the Cordilleras and of Mount Taurus, and the waters diffused over the atmosphere, in clouds, and imperceptible vapours.

My supposition then is, that, at the epocha of this tremendous catastrophe, the sun, deviating from the ecliptic, advanced from south to north, and pursued the direction of one of the meridians which passes through the middle of the Atlantic Ocean and South Sea.* In this course he heated only a zone of water, frozen as well as fluid, which, through the greatest part of the circumference has a breadth of 4500 leagues. He extracted long belts of land and sea-fogs, which accompany the melting of all ices exposed to his direct influence.

He quickly set on fire, with his vertical flame, the constellation of the bear, and of the cross of the south; when vast cupolas of ice, on both poles, smoked on every side. All these vapours, united to those of the ocean, covered the earth with

* I find an historical testimony in support of this hypothesis, in the History of China by Father Martini, book i. 'During the reign of Yaus, the seventh emperor, the annals of the country relate, that for six days together the sun never set, so that a general conflagration was apprehended.' The result, on the contrary, was a deluge which inundated the whole of China. The epoch of this Chinese deluge, and that of the universal deluge, are in the same century.

a universal rain. The action of the sun's heat was farther augmented by that of the burning winds of the sandy zones of Africa and Asia, which blowing, as all winds do, toward the parts of the earth where the air is most rarified, precipitated themselves, like battering rains of fire, toward the poles of the world, where the sun was then acting with all his energy.

Innumerable torrents immediately burst from the north pole, then the most loaded with ice, as the deluge commenced on the 17th of February, the season when winter has exerted its full power over our hemisphere. These torrents issued at once from every flood-gate of the north; their roaring currents rushed furiously down, partly through the channel of the Atlantic Ocean, hurled it up from the abysses of its profound bason, drove impetuously beyond the line, and their collateral counter-tides forced back upon them, and increased by the currents from the south pole, flowing at the same time, poured upon our coasts the most formidable of tides. They rolled along, in their surges, a part of the spoils of the ocean, situated between the ancient and new continent. They spread vast beds of shells, which pave the bottom of the seas at the Antilles and Cape-de-Verd Islands, over the plains of Normandy; and carried even those of the rocks of Magellan's Straits, to the plains watered by the Saone. Encountered by the general current of the pole, they formed at their confluences horrible counter-tides, conglomerating, in their vast funnels, sands, flints, and marine bodies, into masses of indigested granite, into irregular hills, and pyramidical rocks, whose protuberances variegate the soil of France and Germany. These two general currents of the poles meeting between the tropics, tore up from the bed of the seas huge banks of madrepores, and tossed them unseparated on the shores of the adjacent islands, where they subsist to this day.

In other places, their waters spread themselves over the ground in vast sheets, and deposited, by repeated undulations, in horizontal layers, the wreck and viscidities of an infinite number of fishes, sea-urchins, sea-weeds, shells, corals, and formed them into strata of gravel, pastes of marble, of marle, of plaster and calcareous stones, which constitute to this day the soil of a considerable part of Europe. Every layer of our fossils was the effect of a universal tide, which deposited on the

soil of China, strata of vegetable earth, from three to four hundred feet deep.

Then all the plans of Nature were reversed. Islands of floating ice, loaded with white bears, ran aground among the palm-trees of the torrid zone, and the elephants of Africa were tossed amidst the fir-groves of Siberia, where their large bones are still found to this day. The vast plains of the land no longer presented a career to the nimble courser, and those of the sea, roused into fury, ceased to be navigable. In vain did man fly for safety to the lofty mountains: thousands of torrents rushed down their sides, and mingled the confused noise of their waters with the howling of the winds, and the roaring of thunder. Black tempests gathered round their summits, and diffused a night of horror in the very midst of day. In vain did he turn an eager eye to that quarter of the heavens where Aurora was to have appeared: he perceived nothing in the horizon but piles of dark clouds heaped upon each other; a pale glare here and there furrows their gloomy and endless battalions; and the orb of day, veiled by their lurid coruscations, emits scarcely light sufficient to afford a glimpse of his bloody disk, wading through new constellations.

To the disorder reigning in the heavens, man, in despair, yields up the safety of the earth. Unable to find in himself the last consolation of virtue, that of perishing free from the remorse of a guilty conscience, he seeks, at least, to conclude his last moments in the bosom of love, or of friendship. But in that age of criminality, when all the sentiments of nature were stifled, friend repelled friend, the mother her child, the husband the wife of his bosom. Every thing was swallowed up of the waters: there remained on the earth no trace of the glory and felicity of the human race, in those days of vengeance, when Nature involved in one ruin all the monuments of her greatness.

Such convulsions, of which traces without number still remain on the surface, and in the bowels of the earth, could not possibly have been produced simply by the action of a universal rain.

I am aware that the letter of Scripture is express in respect to this; but the circumstances which the sacred historian combines, seem to admit the means which, on my hypothesis, effected that tremendous revolution.

In the book of Genesis it is said, that it rained over the whole earth for forty days and forty nights. That rain was

the result of vapours produced by the melting of the ices, both of the land and sea, and by the zone of water which the sun passed over, in the direction of the meridian. As to the period of forty days, that time appears abundantly sufficient to the vertical action of the sun on the polar ices, to reduce them to the level of the seas, as scarcely more than three weeks are necessary, of the proximity of the sun to the Tropic of Cancer, to melt a considerable part of those on our pole. Nay, at that season, there seems to be wanting but a few puffs of southerly or south-west wind, to disengage from the ice the southern coast of Nova Zembla, and to clear the strait of Waigats, as has been observed by Martens, Barents, and other navigators of the north.

It is farther said, in the book of Genesis, ‘all the *fountains of the great deep* were broken up, and the *windows of heaven* were opened.’ The expression, *the fountains of the great deep*, can, in my opinion, be applied only to an effusion of the polar ices, the real sources of the sea, as the effusions of ice on mountains are the sources of all great rivers. The expression, *the windows*, or cataracts, *of heaven*, denotes likewise, if I am not mistaken, the universal solution of the waters diffused over the atmosphere, which are there supported by the cold, their foci being then destroyed at the poles.

It is afterwards said, in Genesis, that after it had rained for forty days, God *made a wind to blow*, which caused the waters that covered the earth to disappear. This wind undoubtedly brought back to the poles the evaporations of the ocean, which fixed themselves anew in ice. The Mosaic account, finally, adds circumstances which seem to refer all the effects of this wind to the poles of the world, for it is said, Gen. viii. 2, 3, ‘The fountains also of the deep, and the windows of heaven were stopped, and the rain from heaven was restrained; and the *waters returned off the earth continually*, and after the *end of the hundred and fifty days* the waters were abated.’

The continual agitation of these waters perfectly agrees to the motion of the seas, from the line to the poles, then performed without any obstacle, the globe being certainly aquatic; and its annual balancing in the ecliptic, of which the polar ices are the moving power and counterpoise, had degenerated into a diurnal titubation, a consequence of its first motion. These waters retired from the ocean, converted anew into ice upon the poles; and it is worthy of remark, that the space of a hundred and fifty days, which they took to fix themselves in

their former station, is precisely the time each of the poles annually employs to load itself with its periodical congelations.

In the sequel of this historical account of the deluge, we find expressions analogous to the same causes: 'God said again to Noah, While the earth remaineth, seed-time and harvest, and cold and heat, and summer and winter, and day and night, shall not cease.' Gen. ch. viii. v. 22.

There must be nothing superfluous in the *words* of the AUTHOR of Nature, as there is nothing of this description in his *works*. The deluge commenced on the 17th day of the second month of the year, which was among the Hebrews, as with us, the month of February. Man had cast the seed into the ground, but reaped not the harvest. That year there was neither winter nor cold, from the general fusion of the polar ices, their natural foci; and the night, properly so called, did not follow the day, because then there was no night at the poles, which there is alternately one of six months; because the sun, pursuing the direction of a meridian, illuminated the whole earth, as is the case now, when he is in the equator.

We may, farther, arrive at complete assurance of the general effect of the polar effusions of the ocean, from the particular effects of the icy effusions of mountains on the lakes and rivers of the continent. I shall relate some examples of these last; for the human mind, from its natural weakness, loves to particularize all the objects of its studies.

Addison, in his remarks on Misson's Tour to Italy, page 322, says, that there is in the lake of Geneva, in summer, towards evening, a kind of flux and reflux, occasioned by the melting of the snows, which fall into it in greater quantities after noon than at other seasons of the day.

About the middle of the Euripus, a strait of the Archipelago, which separates the ancient Bœotia from the island of Eubea, now Negropont, the water is known to flow sometimes north, sometimes south, ten, twelve, fourteen times a day, with the rapidity of a torrent. These multiplied and frequently unequal movements, cannot possibly be referred to the tides of the ocean, scarcely perceptible in the Mediterranean. A jesuit, quoted by Spon,* endeavours to reconcile these to the phases

* Voyage to Greece and the Levant, by Spon, vol. ii. p. 340.

of the moon ; but supposing his table of them to be accurate, their regularity and irregularity is a difficulty of no easy solution. He adds, that in the sea of Persia the flux never takes place but in the night-time ; and that under the arctic pole, on the contrary, it is perceptible twice in the day-time, without ever being observed in the night. It is not so, says he, with the Euripus.

I shall observe that his remark with respect to the pole evinces that its two diurnal fluxes are the effects of the sun, who acts, only during the day, on the icy extremities of the New and Old Worlds. As to the Euripus, the variety, number, and rapidity of its fluxes, prove their origin is also in icy mountains, situated under different aspects of the sun. For, according to that same jesuit, the island of Eubea, on one side of the strait, contains mountains covered with snow for six months of the year : and we know that Bœotia, on the other side, contains mountains of an equal elevation, and even some crowned with ice all the year round, such as Mount Oeta. If these fluxes and refluxes of the Euripus take place as frequently in winter, which is not affirmed, the cause must be ascribed to the rains which then fall on these lofty collateral mountains.

I have no doubt that objections may be started against the hasty explanation given of the course of the tides, of the earth's motion in the ecliptic, and of the universal deluge, occasioned by the effusions of the polar ices ; but these physical causes present themselves with a higher degree of probability, simplicity, and conformity to the general progress of Nature, than the astronomical causes so far beyond our reach, by which attempts have been made to explain them. It belongs, however, to the impartial reader to decide.

Let us now return to the form of the great bason of the ocean. Two principal currents cross it from east to west, and from north to south. The first, coming from the south pole, puts in motion the seas of India, and, directed along the eastern extent of the old continent, runs from east to west, and from west to east, in the course of the same year, forming, in the Indian Ocean, what are called the monsoons. This we have already remarked ; but what has not been hitherto brought forward, though it well deserves to be so, is, that all the bays, creeks, and mediterraneans of southern Asia, such as the gulfs of Siam and Bengal, the Persian Gulf, the Red

Sea, and a great many others, are directed relatively to this current, north and south, so as not to be stemmed by it.

The second current, issuing from the north pole, gives an opposite movement to our ocean, and, enclosed between the continent of America and ours, proceeds from north to south, and returns from south to north in the same year, forming, like that of India, real monsoons, though not so carefully observed by navigators. All the bays and mediterraneans of Europe, and those on the eastern coast of America, are directed relatively to this current, east and west, so that their mouth only is crossed by them, and their depth is not exposed to the impulsions of the general movements of the ocean.

From the calmness of bays many vessels run thither in quest of anchoring ground ; and for this reason Nature placed, in their bottoms, the mouths of most rivers, that their waters might be discharged into the ocean, without being driven furiously back by the direction of its currents. She has employed similar precautions for the security of even the smallest streams which empty themselves into the sea. Not an experienced seaman who does not know there is scarcely a creek but what has its little rivulet. But for the wisdom apparent in these dispositions, the streams, destined to water the earth, must frequently have deluged it.

Nature employs still other means for securing the course of rivers, and especially for protecting their discharges into the sea. The chief of these are islands which present channels of different directions, that if the winds or currents of the ocean should block up one of their outlets, the waters might have a free passage through another. Here I cannot help observing that we recede very widely from the intentions of Nature, in reuniting the islands of a river to the adjoining continent, for then its waters flow in a single channel only, and when the winds blow in opposition to the current, they can escape neither to the right nor to the left ; they swell, overflow, inundate the plains, carry away the bridges, and occasion most of the ravages which, in modern times, so frequently endanger our cities.

Bays and gulfs are not situated at the extremities of the currents of the ocean, but of islands. At the extremity of the great current of the Indian Ocean is placed the island of Madagascar, which protects Africa against its violence. The islands of the Terra del Fuego defend the southern extremity

of America, at the confluence of the eastern and western currents of the South Seas. The numerous archipelagoes of the Indian Ocean and South Sea are situated about the line, where the two general currents of the north and south seas meet.

[With islands too Nature protects the inlets of bays and mediterraneans. All currents bear upon them, and many are noted for their prodigious swells and their gusts of wind. Not that they contain within themselves the causes of such phenomena, but from their being placed in the foci of the revolutions of the ocean and the atmosphere, for the purpose of weakening their effects. They are in positions nearly similar to those of capes, which are all celebrated for the violent tempests which beat upon them. Hence the sea proverb to *double the cape*, to express the surmounting of some great difficulty. The ocean instead of bearing upon the retiring parts of the continent, sets in upon and must speedily have destroyed those most prominent, had not Nature most wonderfully fortified them.

Every isle has its proper fortification, proportioned to its danger, from the billows of the ocean. It is not necessary to suppose the water roused into a tempest, to form an idea of their fury. The simple action of the trade-winds, however uniform, gives them the most violent impulsion; but their course is retarded by the currents which cross it, and the calms which slacken, and above all, by the banks, shallows, and islands which break it.

Islands, then, are not fragments separated by violence from the continents. Their position in the ocean, the manner they are defended, and their duration, constitute a complete demonstration of this. Considering how long the sea has been battering them with its utmost fury, they must have been, by this time, reduced to a state of total ruin. Scylla and Charybdis, nevertheless, emit to this day their ancient roarings, so as to be heard at the extremities of Sicily.

Islands have existed, such as we now see them, from the origin of the globe, and are in no one respect the work of chance. They contain, as continents themselves do, mountains, peaks, rivers, and lakes, proportioned to their magnitude. To demonstrate this new truth, I shall again touch upon the distribution of the globe.

The chains of mountains in both continents are parallel to

the seas of their coasts : so that if you see the plan of those chains, with its branches, you can determine the shore of the sea which corresponds to them, the mountains being always parallel. You may also, on seeing the sinuosities of a shore, determine those of the chains of mountains in the interior of a country ; for the gulfs of a sea always correspond to the valleys of the mountains of the lateral continent.

These correspondencies are perceptible in the two great chains of the Old and New Worlds. That of Taurus runs east and west, as does the Indian Ocean, enclosing the different gulfs by branches to the extremities of most of their capes. On the contrary, the chain of the Andes, in America, runs north and south, like the Atlantic Ocean. It is also worthy of remark, that these chains of mountains are opposed to the regular winds which cross those seas, and convey emanations from them, their elevation being greater the farther they are removed from the shore.

For this reason the chain of the Andes along the South Sea receives the emanations of the Atlantic Ocean, wafted by the east wind over the vast continent of America. The broader that continent becomes, the greater is the elevation of that chain. Toward the isthmus of Panama, where the continent has no great breadth, the elevation of the mountains is inconsiderable ; but they suddenly rise as the American continent widens. The situation and elevation of this chain were equally necessary to the fertility of this grand division of the New World ; for if, instead of stretching lengthwise by the South Sea, it had extended along the coasts of Brazil, it would have intercepted all the vapours conveyed over the continent by the east wind ; and if it were not elevated to a region of the atmosphere to which no vapour could ascend, because of the subtlety of the air and intenseness of the cold, all the clouds borne by the east wind would be carried beyond it into the South Sea. On either of these suppositions, most of the rivers of South America would be dried up.

The same reasoning may be applied to the chain of Taurus ; but I shall subjoin some farther observations respecting the configuration of those mountains, to confirm the use to which they are destined by Nature. They are crowned, from distance to distance, by long peaks, mostly of granite, which attract the vapours of the atmosphere in such a quantity, that they themselves frequently disappear.

I had the curiosity to examine the nature of the rock of which the Peak of Piterboth, in the Isle of France, is composed, and perceived on its surface small grains of copper. No doubt it must be impregnated with that metal; and to the copper we may perhaps ascribe its virtue of attracting the clouds; this metal, as well as iron, having the property of attracting thunder. I do not know of what materials other peaks are composed, but at the summit and on the ridges of the Andes are found the gold and silver mines of Chili and Peru; and all mines of iron and copper are at the source of rivers, and in elevated situations, where they discover themselves by the fogs which surround them. Whether this attractive quality be common to granite, to rocks of a different nature, or depends on some metal amalgamated with them, I consider all the peaks in the world as real electric needles.

✕ But it was not sufficient that clouds should collect and fix on the tops of mountains; the rivers which have their sources there, as soon as the rainy season was at an end, must have ceased to flow, had not Nature contrived lakes in the vicinity of their peaks, to furnish a regular and constant supply. Most of those lakes, of an incredible depth, answer other purposes; such as receiving the melted snow of mountains, which would otherwise flow too rapidly. When once full they are long in exhausting. They exist, internally or externally, at the source of all regular currents of water; when external they are proportioned by their extent, depth, and discharges, to the size of the river they are designed to emit, as well as the peaks in the vicinity. These correspondencies undoubtedly were known to antiquity; for I have seen ancient medals, on which rivers were represented by figures leaning on an urn, and stretched at the basis of a pyramid, probably designed to denote their source and their discharge.

The islands which deviate from these dispositions, but few in number, have remote relations still more wonderful, and well worthy of being studied. They furnish, in their vegetable and animal productions, other proofs that they are continents in miniature. Every island has its champaign country, its valleys, its hills, its hydraulic pyramids, and its Naiads, in proportion to its extent.

Some few islands, it is true, contain mountains more elevated than their territory may seem to require, as Teneriffe. But that island has mountains of no great elevation propor-

tioned to its bays. Its peak, covered with ice, is directly opposite the entrance of the great sandy desert, called Zahara, and refreshes its shores and atmosphere by the effusion of its snows, in the midst of summer. Nature has placed other glaciers besides at the entrance of this burning desert, such as Mount Atlas.

The icy mountains are principally designed to cool the shores of the seas between the tropics, and the zones of sand to accelerate the fusion of the polar ices. We can indicate only those wonderful harmonies ; but it is sufficient to peruse the journals of navigators, and to study geographical charts, to be convinced that the principal part of the continent of Africa is situated in such a manner, that the wind of the north pole blows most constantly on its coasts ; and that the shore of South America projects beyond the line, so as to be cooled by the wind of the south pole. The trade-winds in the Atlantic Ocean participate of the influence of both poles ; that on our side draws considerably toward the north, and that beyond the line depends greatly on the south pole. These two winds are not oriental, as erroneously imagined, they blow nearly in the directions of the channel which separates America from Africa.

The warm winds in the torrid zone blow, in their turn, the most constantly toward the poles ; and it is singularly remarkable, that as Nature has placed icy mountains in its vicinity to cool its seas, conjointly with those of the poles, she has likewise extended a long zone of sand, to increase the heat of the south wind on its way to warm the seas of the north. This zone commences beyond Mount Atlas, and encompasses the earth like a belt, extending from the most westerly point of Africa to the most easterly extremity of Asia, in a reduced distance of more than three thousand leagues. Some branches of it deviate from the general direction, and advance directly toward the north.

Every icy mountain too has its sandy girdle, which accelerates the fusion of its snows. These zones of sand surround not only their bases, but there are some of them on the higher regions of the mountains up to the very peaks. These sandy belts contribute also to the repair of the waste which the territory of the mountain, from time to time, undergoes : perpetual clouds of dust issue from them, rising on the shores of the sea, where the ocean forms the first deposits of these sands, reduced

to an impalpable powder by the dashing of the waves upon them ; we afterwards find these clouds of dust in the vicinity of lofty mountains. The conveyance of the sands is made from the shores of the sea into the interior of the continent at different seasons, and in various manners. The most considerable happens at the equinoxes, for then the winds blow from the sea into the land.

The icy and sandy zones are found in a different harmony on the continent of the New World. They run, like its seas, from north to south, whereas those of the old continent are directed, conformably to the lengthwise direction of the Indian Ocean, from west to east.

The influence of icy mountains extends farther over the ocean than the land. Those of the two poles take the direction of the channel of the Atlantic Ocean. The snows which cover the long chain of the Andes, in America, serve to cool the whole of the South Sea, by the action of the east wind which passes over it ; but as part of that sea and its shores, sheltered from this wind, by the very height of the Andes, would have been exposed to an excessive heat, Nature has formed an elbow westward, at the most southerly part of America, covered with icy mountains, so that the fresh breezes, which perpetually issue from them, may graze along the shores of Chili and Peru. These breezes, denominated the southerly, prevail there all the year round. They do not, in truth, come from the south pole, for if so, no vessel could ever double Cape Horn, but they come from the extremity of Magellan's Land, which is evidently bent backward, with relation to the shores of the South Sea.

The ices of the poles, then, renovate the waters of the sea, as the ices of mountains renovate those of the great rivers. These effusions of the polar ices press toward the line, from the action of the sun, who is incessantly pumping up the waters of the sea in the torrid zone, and determines, by this diminution of bulk, the waters of the poles to rush thitherward. This is the first cause of the motion of the South Seas, as has been already observed. It would appear highly probable that the polar effusions are proportioned to the evaporation of the ocean.

The sea was destined to receive, by means of the rivers, all the spoils of vegetable and animal productions. Its shores, within the torrid zone, would have been quickly liable to putrefaction, had not Nature employed different methods to keep them cool. It is for this reason, as certain philosophers allege,

that the sea is salt between the tropics ; but it is likewise so to the north ; nay, more so, if we may rely on the recent experiments of the interesting M. de Pagès.

The saltness of the sea, however, does not preserve its waters from corruption, as is vulgarly believed. Mariners well know that if a bottle or cask is filled, in hot climates, with sea water, it soon becomes putrid. Sea water is not a pickle, but a real lixivial, which quickly dissolves dead bodies. Though salt to the taste, it takes out salt sooner than fresh water, as our sailors employ no other in freshening their salt provisions. The bones of all animals, as well as the madrepores, in a state of life brown, red, &c. on being put into sea water, on the brink of the shore, soon became white as snow. Sea water is impregnated not only with salt but bitumen, and other substances not known ; but salt is in it, to assist the dissolution of floating cadaverous bodies, as that we mingle with our food assists digestion. Had Nature made it a pickle, the ocean would be covered with all the impurities of the earth, thus kept in a state of perpetual preservation.

These observations will indicate the use of volcanoes. They do not proceed from the internal fires of the earth, but derive their origin and materials from the waters. There is not a single volcano in the interior of continents, unless in the vicinity of some great lake, such as that of Mexico. They are situated mostly in islands, at the extremity or confluence of the currents of the sea, and in the counter-tide of their waters. This is the reason why we find them in such numbers toward the line, and along the shores of the South Sea, where the south wind brings back all the substances swimming about in a state of dissolution.

Another proof that they owe their support to the sea is, that, in their eruptions, they frequently vomit out torrents of salt water. × Newton ascribed their origin and duration to caverns of sulphur in the bowels of the earth : but that great man had not reflected on the position of volcanoes in the vicinity of water, nor calculated the prodigious quantity of sulphur the magnitude and duration of their fires must have required. Besides, Nature does nothing in vain. What purpose could be answered by such magazines of sulphur in the interior of the earth ? They would remain entire in places not consumed by the fire. What, besides, could renovate them when exhausted ? A supply so constant for keeping up volcanoes is not in the earth, but in the sea. It is furnished by the oils,

bitumens, and nitres of vegetables and animals, conveyed by the rains and rivers into the ocean, where the dissolution of all bodies is completed. Volcanoes take fire, and feed themselves with all these substances.

If Nature had not kindled these furnaces on the shores of the ocean, its waters would be covered with vegetables and animals, which could never evaporate, for they resist the action of the air. Nature purifies the waters by the fire of volcanoes, as she purifies the air by those of thunder; and as storms are more common in hot countries, she has in these likewise multiplied volcanoes, and for the same reason.

We find lavas, indeed, in the interior of countries; but a proof they owe their origin to the water is, that the volcanoes which produced them became extinct when the waters failed them. These volcanoes were kindled by the vegetable and animal fermentations of the earth after the deluge, when the spoils of so many forests and animals, whose trunks and bones are still found in our quarries, floated on the surface of the ocean, and formed prodigious deposits, when the currents accumulated in the cavities of the mountains. Doubtless they caught fire in this state by the effect of fermentation merely, just as we see stacks of damp hay catch fire in our meadows.

It now remains only to refute the opinion of those who maintain that the earth is a secretion from the sun. The chief arguments by which they support it are its volcanoes, its granites, and its progressive refrigeration from year to year.

We have demonstrated that volcanoes do not proceed from the interior of the earth; and granites do not present in the aggregation of their grains the remotest vestige of the action of fire. Agates, flints, and every species of the siliceous, seem to be analogous to vitrifications, from their half-transparency, and their being usually found in beds of marle, resembling banks of lime extinguished; but these substances are not the productions of fire, for lavas never present any thing similar. I have picked up, on the flinty hills of Lower Normandy, oyster-shells, perfectly complete, amalgamated with black flints, called *bisets*. Had these bisets been vitrified by fire, they would have calcined, or, at least, altered the oyster-shells which adhered to them; but these were as sound as if just taken out of the water.

It is a geometrical impossibility that our globe should have been detached from the sun, by the transit of a comet, because it must have, on the very hypothesis of this impulsion,

been hurried along in the sphere of the comet's attraction, or carried back into that of the sun. It has, in truth, remained in the sphere of the sun's attraction; but it is not easy to conceive how it never approached nearer, and maintains the distance of almost 32,000,000 of leagues, while no comet prevents its returning to the place from which it set out. The sun, it is said, has a centrifugal force. The globe of the earth, therefore, must be retiring from it. No, it is alleged, because the earth has a constant tendency towards that luminary. It must, accordingly, have lost the centrifugal force, which should adhere to its very nature, as being a portion of the sun.

It is also a physical impossibility, that the earth should contain in its bowels so many heterogeneous substances, supposing it a separation from a body so homogeneous as the sun; it is impossible they should be in any respect considered as the wreck of solar and vitrified substances, seeing some of our terrestrial elements, as water and fire, are absolutely incompatible. But I shall confine myself to the refrigeration ascribed to the earth, because the evidence on which this opinion rests is level to the comprehension of all men, and is of importance to their security.

✕ If the earth is becoming colder, the sun, from which it is said to have been separated, must be getting cold in proportion; and the mutual diminution of heat in these two globes must become perceptible in a course of ages, at least on the surface of the earth, in the evaporations of the seas, in the diminution of rains, and especially in the destruction of a great number of plants, killed every day, merely from the diminution of only a few degrees of heat, when the climate is changed upon them. ✕ Not a single plant, however, has been lost of all those which were known to Circe, the most ancient of botanists, whose herbal Homer has, in some measure, preserved for us. The plants celebrated in song by Orpheus, and their virtues, subsist to this day.

Such are the testimonies adduced from the vegetable kingdom, respecting the uniformity and constancy of the temperature of the globe: let us examine those of the human race. There are some of the inhabitants of Switzerland, it is alleged, who have perceived a progressive accumulation of the ices on their mountains. I could oppose to this evidence that of other modern observers, who pretend, with as little founda-

tion, that the cold is diminishing there; but I shall adhere to the testimony of the ancients, who say, that if the refrigeration of the earth is perceptible in the life of one man, it must be much more so in that of mankind; now, all the temperatures described by the most ancient historians, as Tacitus, Cæsar, Plutarch, and Xenophon, are precisely the same at this day as they were at the time when those several historians wrote. The book of Job, which contains more profound views of Nature than is generally imagined, the most common whereof were unknown to us two centuries ago, makes frequent mention of the falling of the snows in Arabia, toward the 30th degree of north latitude. Mount Lebanon bears the Arabian name of Liban, white, on account of the snows with which its summit is covered all the year round.

✕ If, during a period of more than 3000 years, the cold had gone on increasing from year to year, in all these climates, their winters must now have been as long and severe as in Greenland. But Lebanon, and the lofty provinces of Asia, have preserved the same temperature. The little isle of Ithaca is still covered in winter with the hoar-frost; and it produces, as in the days of Telemachus, the laurel and the olive.

STUDY FIFTH.

REPLY TO OBJECTIONS AGAINST PROVIDENCE, FOUNDED ON THE DISORDERS OF THE VEGETABLE KINGDOM.

✕ THE earth, say the objectors, is a garden injudiciously laid out. Men of wit, who never travelled, have painted it, when proceeding from the hand of Nature, as if the giants had been fighting in it. They represent its rivers flowing at random; its morasses as vast collections of mud; the trees of its forests turned upside down; its plains buried under rocks, or overspread with thorns; all its highways unpassable; its culture the puny efforts of human genius. Such representations have sometimes afflicted and inspired me with distrust of the AUTHOR of Nature. To no purpose had He in other respects loaded man with benefits; one of

our most pressing necessities had been overlooked, if He had neglected to care for our habitation.

The inundations of rivers, such as the Amazon, Oronoco, and many others, are periodical. They manure the lands they inundate ; and it is well known that the banks of those rivers swarmed with populous nations before Europeans settled there. The inhabitants were benefited from these inundations, by the abundance of the fisheries and the fertility of the lands. So far from considering them as convulsions of Nature, they received them as blessings from Heaven, just as the Egyptians prized the overflowings of the Nile. Was it, then, a mortifying spectacle to see their deep forests intersected with water, which they could traverse in their canoes, and pick the fruits at their ease ? Nay, certain tribes of the Oronoco, determined by these accommodations, had acquired the singular habit of dwelling on the tops of trees, and seeking under their foliage an habitation, food, and a fortress. Most of them, however, inhabited only the banks of rivers, and preferred them to the surrounding deserts, though not exposed to inundations.

✕ We see order only where we can see corn grow. Our habit of confining the channels of rivers within dikes and mounds, of gravelling and paving our high roads, of applying the straight line to our garden-alleys and basons of water, of squaring our parterres, nay, our very trees, accustoms us to consider every deviation from our rectangles as abandoned to confusion. But it is in places with which we have been tampering, that we frequently see real disorder. We set fountains a playing on the tops of mountains ; plant poplars and limes upon rocks, throw our vineyards into valleys, and raise our meadows to the declivities of hills. Let these laborious exertions but be relaxed, and all this culture, the work of man, will disappear ; demonstrating how inefficient his power is, when struggling against that of Nature.

✕ I have not had the felicity, like the primitive navigators, who discovered uninhabited islands, to contemplate the face of the ground as it came from the hand of the CREATOR ; but I have seen portions of it which had undergone alterations sufficiently inconsiderable to satisfy me that nothing could then equal their virgin beauties. To the influence of these first aspects I ascribe the superior talents of the earlier writers who have painted Nature, and the sublime enthusiasm

which a Homer and an Orpheus have transfused into their poesy. Among the moderns, the historian of Anson's expedition, Cook, Banks, Solander, and others, have described these natural sites, in the islands of Tinian, Masso, Juan Fernandez, and Otaheite, delighting all persons of real taste, though these islands had been, in part, degraded by the Indians and Spaniards.

The Author here goes on to lament that he had seen only countries frequented by Europeans, and desolated by war or by slavery. He, however, excepts two places he had visited in the course of his travels, the one in the Isle of France, the other in Russian Finland. He dwells at great length on the manner in which Nature disposes her plans in climates so very opposite, and concludes his observations by stating, that it would be no easy matter to describe the hospitable reception we found in the solitary mansions of those northern regions. Their masters exerted themselves, in every possible way, to detain us among them for many days together. They sent to the distance of ten, of fifteen leagues, invitations to their friends and relations, to come and assist them to entertain us; and the days and the nights passed away in dancing and festivity.

Plants are not scattered about at random over the earth; there is order in their combination. If we examine their expansion, attitude, magnitude, and proportions, we shall find as much harmony in the aggregation of their parts, as in that of their species. It is impossible, in any respect, to consider them as mere mechanical productions of heat and cold, of dryness and humidity, as all these physical causes united could not have determined the port of one single moss. It has been laid down as an indubitable principle, that their saps ascend through the wood, and redescend through the rind. To this I shall oppose the instance of a great chestnut tree, in the garden of the Thuilleries, which, for twenty years past, has had no bark round its under part, and is nevertheless in perfect vigour. On the other hand, we have seen old willows without a bit of good wood left. Besides, how is it possible to apply this principle of vegetation to a multitude of plants, some composed entirely of tubes, and others having no rind, but enclosed only in dry pellicles?

Neither is there more truth in the supposition that they

rise in a perpendicular line, that to this direction they are determined by the action of columns of air. Some, it must be allowed, do follow this direction ; but creeping plants of every species deviate from it. Others ascend vertically, and having arrived at a certain height, in an air perfectly unobstructed, fork off in various tiers, and send out their branches horizontally. All these attitudes may be seen under the same bearing of wind. Nay, some assume forms that all the art of the gardener could hardly impress upon them ; such is the badamier of the Indies. There are plants uncommonly vigorous which recede from the vertical line the moment they get above ground ; such is the false potatoe of India, which loves to crawl along the sand of the shores ; and the ratan of China, which frequently grows in similar situations. These plants do not crawl from weakness. The scions of the ratan are so strong that the Chinese make cordage of them for their shipping ; and when on the ground, they serve as a trap for the deer, who cannot disengage themselves. They are nets spread out by the hand of Nature.

I should never have done were I to touch but slightly on the different ports of vegetables ; what I have said will demonstrate that there is not a single one whose direction is determined by the vertical column of the air, an error that has gained currency from its being taken for granted that plants affected the greatest volume of air.

Plants, it has been said, are mechanical bodies. Try then to construct a body so slim, tender, and fragile, as a leaf, which shall for whole years resist the winds, the rains, the keenest frost, the most ardent sun. < A spirit of life, independent of all latitudes, governs, preserves, and reproduces plants. They repair the injuries they may have sustained, and skin over their wounds with a new rind. The pyramids of Egypt are crumbled into powder ; but the grasses which clothed the soil while the Pharaohs filled the throne subsist to this day. How many Greek and Roman sepulchral monuments of stone riveted with iron, have disappeared ! Nothing remains around their ruins but the cypresses which shaded them !

It is the sun, say they, who gives existence to vegetables, and maintains it. But that all-powerful agent of Nature is not the sole cause even of their expansion. If his heat invites most of those of our climates to open their flowers, it

obliges others to shut them : nay, his remoteness from our hemisphere does not destroy in it the power of Nature. At that season vegetate most of the mosses of the rocks, and then the trunks of trees cover themselves, in humid situations, with plants imperceptible to the naked eye, called *minium* and *lichen*, which give them the appearance, in frosty weather, of columns of green bronze. These vegetations, in the severity of winter, overturn all our reasonings respecting the universal effects of heat, as plants of an organization so extremely delicate require a temperature the most gentle.

Again, the fall of the leaf itself, considered as an effect of the sun's absence, is not occasioned by cold. If the palm retains its foliage all the year in the south, the fir is equally an evergreen in the north. The birch, the larch, and other species of trees, shed their leaves in northern climates, on the approach of winter ; but a similar depredation is likewise made on other trees, to the southward. It is the resinous substance, we are told, which preserves the foliage of the fir in the north : but the larch, likewise a resinous plant, is stripped of its verdure in winter ; whereas the filaria, the ivy, the privet, and many other species, not resinous, continue in full verdure at all seasons.

Without having recourse to mechanical causes, the effects of which contradict themselves on an attempt to generalize them, why not recognise, in these varieties of vegetation, the steady and uniform direction of a Providence ? That Providence has assigned to the south, trees always green, clothed with a broad foliage, to shelter the animal creation from heat. The animals of hot climates have otherwise been tenderly cared for, in being provided with clothing denuded of hair, consequently light and cool ; and in having their habitations garnished with green ferns and liannes, ever fresh and comfortable. Neither has bountiful Nature neglected the animals of the north. She has spread as a roof over their heads, the evergreen firs, whose lofty and tufted pyramids ward off the snow from their roots, and whose branches are so well furnished with long gray mosses, that the trunk is rendered almost invisible ; for a bed, she has accumulated a bank of moss on the ground, a foot in thickness, and the soft and dry leaves of many trees, which fall precisely at the approach of the inclement season : finally, their provision is

found in the fruits of those very trees, then arrived at full maturity.

But one of the greatest blessings of Providence conferred on the animals of the north, is their clothing of long and thick hair, which grows in winter, and falls off in summer. Naturalists account for this growth and decay, from the influence of heat. They pretend to support their system by instancing the human hair and beard, which grow rapidly in summer. But I would ask them how, in cold countries, horses, which in summer are sleek and smooth, assume in winter a long and shaggy coat, like the fleece of a sheep? To this they reply, The internal heat of their body, increased by the external action of the cold, produces this wonderful phenomenon.

To this I object, that cold does not produce this effect on the human beard and hair, for it retards their growth; that in the case of animals, the hair is longer and thicker on those parts of the body that have the least natural heat, such as the tail, which is very bushy in horses, martens, foxes, and wolves; that this hair is short and thick on those parts which have most natural heat, as the belly. Their backs, ears, and frequently their very paws, are most amply furnished with hair. But I merely suppose this last objection; the external and internal heat of an African lion ought surely to be, at least, as ardent as that of a Siberian wolf; whence is it, then, that the first is smooth, as if newly shaven, whereas the other is shagged up to the eyes.

The cold, deemed one of the greatest obstacles to vegetation, is as necessary to certain plants as heat is to others. Vegetable transmigrations, however, might be effected by employing ice, in the south, for the propagation of the plants of hot climates, as I have seen ice imported from Etna 60 leagues distant, and preserved for months in the sultry temperature of Malta; so that I think it might be procured in every country of the globe.

So far is cold from being the enemy of all plants, that in the north we find forests of the tallest growth and greatest extent in the world; and at the foot of the eternal snows of mount Lebanon, the cedar, the king of vegetables, rises in all his majesty. The fir, next to him the greatest tree of our forests, arrives at a prodigious size only on icy mountains, and in the cold climates of Norway and Russia.

I shall conclude this Study with refuting an error advanced by some celebrated writers, and highly prejudicial to rural economy, namely, that cold is diminished in the north in proportion as the forests are cut down.

One day in summer, about two o'clock, being about to cross the forest of Ivry, I saw some shepherds with their flocks, at a distance from it, reposing under the shade of some trees. I asked them why they did not take shelter in the forest from the heat of the sun. They replied it was too hot there at that time of the day, and that they never drove their sheep thither, except in the morning and evening. Being desirous however of traversing the forest, I engaged a lad to attend me as a guide. I felt all the way a stifling heat, much more ardent than was at that hour felt in the open country. I did not begin to respire freely till I had got fairly clear of it, and had made my escape from the edge of the forest more than the distance of three musket shot. I have since reflected on what the shepherds told me, respecting the heat of the woods, and on what I myself had experienced ; and I have in fact remarked that in the spring all plants are more forward in the vicinity of woods, and that you find violets in flower on their borders much earlier than you gather them on the open plain, or on a naked hill.

Clearing ground of woods so greatly increases the heat in warm countries, as I have had occasion to observe in the Isle of France, on several parts of the coast, that the very grass which pushes a way during the rainy season is soon burned up by the sun ; and there results from this parchedness of the coast, the drying up of many rivulets ; for the trees planted on the heights attract thither the humidity of the air, and fix it there. Besides, by destroying the trees on the high grounds, the valleys are robbed of their natural manure, and the plains of the pallisades which shelter them from the high winds. These winds desolate to such a degree the cultivation in many places, that nothing will grow. I ascribe to this the sterility of the heaths in Brittany. In vain has the attempt been made to restore their ancient fertility ; it never can succeed till their shelter and temperature are recalled, by resowing their forests. But there is a requisite prior even to this ; the peasantry must be rendered happy. The prosperity of a country depends, above all things, on that of its inhabitants.

STUDY SIXTH.

REPLY TO OBJECTIONS AGAINST PROVIDENCE, FOUNDED ON
THE DISORDERS OF THE ANIMAL KINGDOM.

WE shall continue to display the fecundity of northern regions, to overturn the prejudice which ascribes this principle of life, in plants and animals, only to the heat of the south. I could expatiate on the numerous and extensive chases of elks, rein-deer, water-fowls, heath-cocks, hares, white bears, wolves, foxes, martens, ermines, beavers, &c., which the inhabitants of the northern districts annually carry on, the very peltry of which forms a considerable branch of commerce for the markets of all Europe: but I shall confine myself to their fisheries, because these precious gifts of the waters, presented to all nations, are no where so abundant as in the north.

From the rivers and lakes of the north are extracted incredible multitudes of fishes. John Schæffer, in his History of Lapland, tells us they catch annually at Torneo, no less than 1300 boat-loads of salmon; the pikes are found there as long as a man, and that every year they salt as many as support four kingdoms of the north. But these fisheries fall far short of those of the seas,* from whence is dragged the enormous whale, usually about 60 feet in length, 20 feet broad over the body and at the tail, 18 feet high, and which yields to 130 barrels of oil. The fat is two feet thick, and in cutting it off they use knives six feet long.

From these seas of the north issue annually innumerable shoals of fishes, enriching the fishers of Europe. Their size is larger than in temperate latitudes, and their species more numerous. There are computed twelve species of the whale tribe; and plaice are caught of the enormous weight of 400lbs. But of fishes best known to us, herrings for example, it is an incontestable fact, that these seas every year send out more than sufficient to feed all the inhabitants of Europe.

The herring fishery was carried on so far back as the year 1163, in the Straits of the Baltic, between the islands of Scho-

* Consult Frederic Martens, of Hamburg.

non and Seeland. Philip de Mesieres relates, that in 1389, during September and October, the quantity of herrings in these straits was so prodigious, that, 'for several leagues together you might have cut them with a sword; and it is credibly reported, that 40,000 boats are employed for two months in catching herrings; each boat containing at least six persons, and many not less than ten.' He makes the number of persons employed 300,000 Prussians and Germans.

In 1610, the Dutch, who carry on the herring-fishery still farther north, where the fish is better, derived a revenue from it of 2,650,000*l.* sterling. I myself have witnessed in Amsterdam, in 1762, the joy of the populace expressed by displaying streamers over the shops where that fish was exposed to sale, on the first arrivals; and in every street this was the case.

In 1782, at the mouth of Gothela, a small river which washes the walls of Gottenburg, 139,000 barrels were cured by salt, 3,700 smoked, and 2,845 casks of oil extracted from what could not be preserved. The Gazette of France,* which contains an account of this fishery, remarks that, previous to 1752, these fishes had entirely disappeared for 72 years together. I ascribe their desertion of this coast to the noise of some naval engagement, as is the case with the turtle of the island of Ascension, which forsake the road for weeks together, when vessels passing that way discharge their great guns. It may be likewise accounted for from a conflagration of the forests, which might have destroyed the vegetables that attracted them to the coast.

Pont-Oppidan, the Fenelon of Norway, relates,† that when the herrings coasted along the shores of Norway, 'The whales, which pursue them in great numbers, and dart their water-spouts into the air, give to the sea the appearance of being covered over with smoking chimnies. The herrings, to elude the pursuit, throw themselves close in shore into every little bay or creek; they branch off in such quantities that you may take them out in baskets-full, and the country people can even catch them by the hand.' After all the united efforts of these fishers can effect, hardly any impression

* Friday the 11th of October, 1782.

† Pont-Oppidan's Natural History of Norway.

is made on their general column, which coasts along Germany, France, and Spain, as far as the Straits of Gibraltar; devoured on their passage, night and day, by multitudes of fishes and sea-fowls, till the column is lost on the shores of Africa, or returns, as other authors tell us, to the north. For my own part, I no more believe herrings return from whence they came, than that fruits reascend the trees from which they have once dropped; Nature being so magnificent in the entertainment which she provides for man, that she never serves up the dishes a second time.

The immense glut of herrings is astonishing; but how is that astonishment increased, when it is considered that this column is not half of what annually issues from the north! It separates at the northern extremity of Iceland, and while one division diffuses plenty over the shores of Europe, the other pushes forward to convey similar benefits to those of America, accompanied by an incredible multitude of pilchers and cod, which renders fish so plenty in the island, that the inhabitants have them dried, and reduced to meal with a grindstone, to serve as food for their oxen and horses.

It would appear that another column of those fishes issues from the north pole to the eastward of our continent, and passes through the channel which separates America from Asia. But as these seas are not much known to us, I shall pursue this fish no farther. I must however observe, that more than half those herrings are filled with eggs, and if the propagation were to go on to its full extent for three or four generations only, the ocean itself would be unable to contain them.

The south pole is not less productive of fishes than the north. The nations nearest to it live on fish, and practise husbandry of no kind. Sir John Narborough says, in his *Journal of a Voyage to the South Seas*, there must be on these shores an infinite number of fishes to support the sea-calves, penguins, and other fowls, which live solely on fish, and are all equally fat, though their number is beyond computation. They one day killed 400 sea-lions in half an hour. Their flesh is as tender and white as lamb, and excellent food when fresh, but still better when it has been some time in salt. Here I must observe, that the fish of cold countries only take in salt easily, and retain part of their flavour. It seems as if Nature intended thus to communicate to all the nations

of the globe the abundance of the fisheries which issue from the frigid zones.

The western coast of America is not less amply supplied with fish. 'Along the whole coast,' says Garcillaso de la Vega,* 'from Arequipa to Tarapaca, a tract of more than 200 leagues, they dung the land with the excrement of certain fowls, called sea-sparrows, whose numbers exceed all belief. They inhabit the desert islands on the coast, and by the accumulation of their ordure, they whiten them to such a degree, that, at some distance, they might be taken for mountains covered with snow. The Incas reserved to themselves the right of disposing of those islands, as a royal boon to such and such a favourite prince. This dung was entirely the produce of the fishes on which those fowls constantly fed.

It will be no easy task, I confess, to refer to the beneficence of Nature the wars which animals wage with each other. Why should beasts of prey exist? Supposing me incapable of resolving this difficulty, Nature must not be accused of cruelty because I am deficient in mental ability. She has arranged what we do know with such consummate wisdom, that we are bound to give her credit for the same character of wisdom in cases where we cannot find her out unto perfection. I will, however, declare my opinion, and offer a reply to that question.

Beasts of prey are necessary. What otherwise would become of the carcasses of so many animals which perish on the land and in the water, which would consequently be poisoned with infection. Several species of carnivorous animals devour their prey alive. But who can tell whether in this they do not transgress the law of their nature? Man knows very little of his own history: how is it possible he should know that of the beasts? Captain Cook observed, in a desert island in the southern ocean, that the sea-lions, the sea-calves, white bears, sots, eagles, and vultures, lived in perfect concord. I have observed a similar good agreement among the fool and the frigate of the island of Ascension. But, after all, it was merely an association of plunderers; they lived peaceably together, that they might devour unmolested their common prey, the fishes, which they all gulped down alive.

* History of the Incas, book v. chap. iii.

Let us revert to the great principle of Nature : she has made nothing in vain. She destines few animals to die of old age ; nay, I believe, she permits man only to complete his career of life, because his old age alone can be useful to his fellow-creatures. To what purpose would serve, among the brute creation, grandsires destitute of reflection to progeny brought into existence in the maturity of their experience ? On the other hand, what assistance could decrepit parents find among children which abandon them the instant they have learned to swim, fly, or walk ? Old age would be to them a burthen from which they are delivered by the ferocious animals. Besides, from their unobstructed generations would arise a posterity without end, which the globe is not sufficient to contain. The preservation of individuals would involve the extinction of the species.

Animals might always live, I shall be told, in a proportion adapted to the places they inhabit ; but in that case they must cease to multiply ; and from that moment farewell the loves, the nests, the alliances, the foresight, and all the harmonies which subsist among them. Every thing that is born is doomed to die. But Nature, in devoting them to death, does not render the instant of it cruel. It is usually in the night time, in the hour of sleep, that they sink under the fangs and teeth of their destroyers. Twenty strokes, sent home in one instant to the sources of life, afford no leisure to reflect that they are going to lose it. [That fatal moment is not imbittered to them by any of the feelings which render it so painful to the human race, regret for the past, and solicitude about futurity.] Their unanxious spirits vanish in the midst of a life of innocence, and frequently during the indulgence of the fond illusions of love.

Unknown compensations may, perhaps, farther sweeten this last transition. I shall observe at least, as a circumstance deserving attentive consideration, that the animal species whose life is sacrificed to the support of that of others, such as that of insects, do not appear possessed of any sensibility. If the leg of a fly happens to be torn away, she goes and comes as if she had lost nothing ; the cutting off a limb so considerable is followed by no fainting, convulsion, scream, nor symptom of pain whatever. Cruel children amuse themselves with thrusting straws into their anus ; they rise into the air thus empaled ; they walk about and perform all

their usual motions, without seeming to mind it. Others take lady-birds, tear off a large limb, run a pin through the nerves and cartilages of the thigh, and attach them with a slip of paper to a stick. These unfeeling insects fly humming round and round the stick, unweariedly, and without any appearance of suffering pain. Reaumur one day cut off the fleshy and muscular horn of a large caterpillar, which continued to feed as if no mutilation had taken place. Is it possible to think, that beings so tranquil in the hands of children and philosophers, endure any feeling of pain when they are gobbled down in the air by the birds?

These observations might be extended much farther, particularly to that class of fishes having neither bone nor blood, and of these consist the greatest number of the inhabitants of the seas, and they appear to be equally void of sensibility. I have seen, between the tropics, a tunny, from the nape of whose neck a sailor scooped out a large slice of the flesh with a stroke of the harpoon, which was forced backward to his head; he followed the ship for several weeks, and was outdone by no one of his companions, either in speed or friskiness. I have seen sharks, after being struck with musket bullets, return to bite at the hook, from which they had just before escaped, with their mangled throat.

We shall find a great analogy between fishes and insects, if we consider that neither have bones nor blood; that their flesh is impregnated with a glutinous liquid, apparently the same in both, from its emitting a similar odour when burned; that most fishes pass, on their birth, through the state of insects, issuing from their eggs in the form of worms; that both are cased in scales; that many fishes are provided with beards and horns, like insects; finally, that their constitutions, metamorphoses, manners, and fecundity being the same, there is a powerful temptation to ascribe to these two numerous classes the same insensibility. As to animals which have blood, let Malebranche say what he pleases, they are sensible, expressing a sense of pain by the same signs which we do.

Let us now proceed to consider the generation of animals. Certain Egyptians told Herodotus, that particular species of animals were formed of the fermented mires of the ocean and of the Nile. Whatever respect I have for the ancients, I absolutely reject their authority in physics. If some of them

have advanced that every thing proceeded from corruption, others, more honest and sincere, have refuted them, even in the earliest times.

✕ Corruption produces no one living body, but is fatal to all, especially to those which have blood, and chiefly to man. No air is unwholesome but where there is corruption. How could such a principle have generated, in animals provided with toes, nails, and claws; skins clothed with hair and plumage; jaws pallisadoed with teeth adapted for cutting and grinding; heads adorned with eyes furnished with lids to defend them from the sun? How could the principle of corruption have collected those scattered members; unite them by nerves and muscles; support them by bony substances, fitted with pivots and hinges; feed them with veins filled with blood which circulates, whether the animal be in motion or at rest; cover them with skins precisely adapted to the climates they inhabit; afterwards, make them move by the combined action of a heart and a brain, and give to all these machines, produced in the same place, and formed of the same slime, appetites and instincts so entirely different? How could it have kindled in them the desire of reproducing themselves by any other method than that which originally gave them existence?

Corruption, so far from conferring life, must have deprived them of it, for it generates tubercles, inflames the eye, dissolves the blood, and produces an infinite number of diseases in most animals.* The fermentation of any substance whatever could never have formed an organized animal, nor even the egg from which it issued. Indeed the first operation of Nature is so mysterious, that an egg with the smallest aperture loses its prolific power. The slightest contact with the exterior air, extinguishes in it the radical principles of life. It is neither matter, then, nor degrees of heat, which are wanting to man to imitate Nature in the pretended creation of beings; and this power, ever young and active, has by no means wasted itself, as it is always exerting itself in their

* From this may be concluded how dangerous the putrid emanations from our church-yards must be to the inhabitants of cities. Parish churches, in which so many corpses are interred, become impregnated with an air so corrupted, especially in spring, when the ground begins to grow warm, that I consider this as one of the chief sources of the small-pox, and of the putrid fevers which are prevalent at that season.

reproduction ; a display of omnipotence equally wonderful with that of conferring existence at the first.

The wisdom with which Nature has settled their proportions is admirable. On a careful examination of animals, we shall find no one deficient in its members, regard being had to its manners, and the situation in which it is destined to live. The large and long bill of the toucan, and his tongue formed like a feather, were necessary to a bird who hunts for insects on the humid sands of American shores. It was needful that he should be provided with a long mattock to dig, a large spoon to collect his food, and a tongue fringed with delicate nerves to enjoy the relish of it. Long legs and neck were necessary to the heron, the crane, the flamingo, and other birds which have to walk in marshy places, and seek their prey under the water. Every animal has feet, a throat, or a bill, formed to suit the soil they tread, and to procure their food. From the different configurations of animals, naturalists derive the characters which distinguish beasts of prey from such as live on vegetable substances.

These organs of animals are themselves indelible as their instincts. I have seen ducks propagated at a distance from water, which retained on their feet the broad membranes of their species, which on the approach of rain clapped their wings, screamed aloud, and seemed to complain to heaven of the injustice of man, who had banished them from their element. Some philosophers consider the spurs appended to the heels of hogs as useless, because they do not bear upon the ground ; but this animal, destined to live in swampy places, would frequently sink under the impulse of gluttony, had not Nature placed above his heels two prominent excrescences, to assist him in getting out again. How was it possible for enlightened men to misunderstand the use of these accessory members, imitated by our country clowns in stilts ; which, from this very resemblance, they call *hogs-feet*, and are employed in wading through marshy ground ?

Nature, who varies her means with the obstacles to be surmounted, has bestowed excrescences on the heels of the hog, for the same reason that she has clothed the rhinoceros with a hide rolled up in several folds, in the midst of the torrid zone. This clumsy animal appears invested with a threefold mantle ; but being destined to live in the miry morasses of India, he would have been in danger of sinking from his

enormous weight, had he not been endowed with the strange faculty of extending, by inflation, the folds of his skin, and of rendering himself lighter, by occupying a larger space.

What to us appears a deficiency in certain animals, is a wonderful compensation of Providence ; and it would be an exception from the general law of Nature if she had any other than the utility and happiness of the beings which she has formed. Hence the elephant has a proboscis, which serves like a hand as he scrambles over the roughest mountains, where he delights to live, in picking up the grass of the field, and the foliage of the trees, which the inflexibility of his neck would not permit him otherwise to reach.

She has infinitely varied, among the animal creation, the means of defence and subsistence. It cannot be supposed that those which move slowly or scream violently are in a state of habitual suffering ; for how could a race of creatures always sickly perpetuate itself, nay, become one of the most universally diffused of the whole globe ? The sluggard, or sloth, is found in Africa, Asia, and America. His tardiness is no more a paralytic affection than that of the turtle and of the snail. The cries he utters, when you go near him, are not cries of pain. But among animals, some being destined to roam about the earth, others to remain fixed, their means of defence vary with their manners. Some elude their enemies by flight, others repel them by hissings, hideous figures, poisonous smells, or lamentable cries. Some deceive the eye, as the snail, which assumes the colour of the walls, or of the bark of trees, whither he flies for refuge ; others, by an inconceivable magic, transform themselves at pleasure into the colour of surrounding objects, as the cameleon.

O, how sterile the imagination of man, compared to the intelligence of Nature ! He has produced no one thing of which he has not borrowed the model from her works. Genius itself is neither more nor less than the art of observing. Man cannot forsake the path of Nature, even when he is determined to go wrong. We are wise only with her wisdom : and we play the fool in proportion as we attempt to derange her plans.

Our female friends, too, who, sweetly capricious, amuse themselves with embroidering fancy flowers on their dress, borrow their patterns from the garden. Examine on their gowns and handkerchiefs the sportive productions of their ima-

gination : there you have the flower of the pink on the foliage of the myrtle ; roses on the stalk of the reed ; pomegranates in place of ears of corn. Nature alone produces rational harmonies, and assorts, in both animals and plants, none but parts adapted to the places, the air, the elements, the uses for which she has destined them. Never was a race of monsters beheld issuing from the sublimity of her conceptions.

I have frequently heard of living monsters announced for public exhibition at our fairs, but never had the fortune to see one. One day a placard was displayed at the fair of St. Ovide, 'A cow with three eyes, and a sheep with six feet.' I had a curiosity to see those animals, and examine the use of organs and members to my apprehension entirely superfluous : how Nature had attached two new legs to the body of a sheep, and had formed, to put them in motion, new nerves, veins, and muscles, with their insertions. The third eye of the cow perplexed me still more. I had nothing for it, then, but, like other simpletons, to part with my money to gratify my curiosity. The people were coming out in crowds, delighted and astonished with their pennyworth. I too, at last, contemplated the marvellous sight. The two superfluous legs of the sheep were only two shrivelled pieces of skin, cut out like thongs, and hanging down from the breast, without touching the ground, and incapable of being of any use whatever to the poor animal. The pretended third eye of the cow was a kind of oval wound in the middle of the forehead, without orbit, without apple, without lid, and without any membrane which presented one single organized part of an eye. I withdrew without examining whether these accidents were natural or artificial, for, in truth, it was not worth the trouble.

The monsters preserved in spirits of wine, and exhibited in cabinets, such as pigs with the proboscis of an elephant, children double-bodied, or with two heads, prove much less a laboured production of Nature than the interruption of it. None of those beings could have attained a complete expansion ; and so far from demonstrating that the intelligence which produced them had fallen into a blunder, they attest the immutability of Supreme Wisdom, which has rejected them from its plan, by refusing them life.

The benignity of Nature toward man challenges the highest admiration, in defying him, on the one hand, to infringe her laws to gratify caprice ; on the other, she frequently per-

mits him to derange some of them to relieve his necessities. For instance, she connives at the production of the mule from the copulation of the ass and the mare, that being serviceable in mountainous countries, but she forbids the reproduction to proceed, as the primitive species are of more general utility.

It is easy to discern, in most of the works of Nature, these maternal condescensions, and, may I call them so? royal provisions. They manifest themselves particularly in the productions of the garden. She feeds the human race, in part only, with vegetable superabundance, bestowed as the reward of industry. However fertile the soil, vegetables of the same species with those produced in the garden degenerate in the uncultivated plain, grow wild, and spend themselves in foliage and branches. Is it not, therefore, an instance of wonderful complaisance on the part of Nature, that she should transform, under the hand of man, into pleasant and wholesome aliment, the same juices which would be converted in the forest into lofty stems and tough roots? From time to time Nature presents man with varieties both useful and agreeable, extracted from the same genus. All our fruit-trees come originally from the forest, and no one there perpetuates itself in its species. Were she to suspend her particular laws of beneficence in the gardens of our miscreants, to establish in them her pretended general laws, what would be their astonishment to find nothing reproduced but some miserable wild carrots, and unsavoury fruits of every sort, such as she produces on the mountains for the coarse palate of the wild boar. The hen, which lays eggs much too large in proportion to her size, and for nine months uninterruptedly, contrary to all the laws of incubation among the feathered race, would then fall back into the general order, and produce, at farthest, twenty eggs in a year. The hog would lose his superfluous fat. The cow, which yields twenty-four quarts of milk a day, would give only a bare sufficiency to suckle her calf.

To this it is replied, that this profusion of eggs, fat, and cream from our domestic animals, is the effect of their copious feeding. But neither does the mare give as much milk as the cow, nor the duck lay as many eggs as the hen, nor the ass clothe himself with fat like the hog, though these animals all feed plentifully alike. Besides, the mare, the she-goat,

the ewe, the she-ass, have only two teats, whereas the cow has four.

The cow deviates in a very remarkable manner from the general laws of Nature, who has adjusted, in every animal species, the number of teats in the mother to that of the young ; she, however, is furnished with four paps, though she produces but one calf, and very rarely two, because the two supernumeraries were destined to be nurses to the human race. The sow, it is granted, has only twelve teats, though intended to bring up sometimes a litter of fifteen or more. Here the proportion seems defective. But if the first has more teats than are requisite to the number of her family, and the second too few for hers, it is because the one is ordained to present man with the surplus of her milk, and the other with that of her brood.

Is it not strange that when so many plants and animals exhibit proportions so beautiful, adaptations so wonderful to our necessities, and proofs so evident of a Divine benevolence, we should collect shapeless abortions, pigs with a long proboscis, as if our yards teemed with young elephants, and arrange them in our cabinets as a display of Nature ? Those who preserve them as invaluable curiosities, and deduce from them consequences and doubts respecting the intelligence of their AUTHOR, discover as much want of taste, and act as unfairly, as one who should go into the workshop of a founder, and pick up the figures accidentally mutilated, metallic moulds which might lie scattered about, and triumphantly display them as a proof of the artist's blundering ignorance !

The ancients burned monsters, the moderns preserve them in spirits of wine. Oh ! if the earth were indeed abandoned to disorder, and that, after an infinity of combinations, there should at last appear, amidst the monsters which covered it, a single body well proportioned, and adapted to the necessities of man, what a source of satisfaction would it be to creatures at once sensible and unhappy, to catch but a glimmering of an INTELLIGENCE somewhere, who took an interest in their destiny !

STUDY SEVENTH.

REPLIES TO THE OBJECTIONS AGAINST PROVIDENCE FOUNDED
ON THE CALAMITIES OF THE HUMAN RACE.

THE arguments deduced from the varieties of the human race, and the evils accumulated by the hand of Nature, by governments, and by religions, on the head of man, attempt to demonstrate that men have neither the same origin, nor any natural superiority above the beasts; that their virtues are destitute of all prospect of reward, and that no Providence watches over their necessities to supply them.

Our discussion of this interesting subject shall commence with a reply to the objections founded on the varieties of the human species. We pretend not to deny that there are men black and white, copper-coloured and pale. Some have a beard, others little, if any. < But these pretended characters are accidents merely. Horses white, bay, or black, are animals of the same species. The *Albinoes*, or white negroes, are a species of lepers, and no more form a particular race of negroes, than persons with us who have been marked by the small-pox form a race of spotted Europeans.

✕ The black colour is a blessing of Providence to the inhabitants of tropical countries. White reflects the rays of the sun, black absorbs them. The first redoubles his heat, the second weakens it. Nature has employed the opposite effects of these colours for multiplying or weakening, on the earth, the heat of the orb of day. The farther you advance south, the blacker are men and animals; and the farther you proceed northward, the whiter is the colour of both. Nay, when the sun withdraws from the northern regions, many animals there, in summer, of different colours, begin to whiten; and those of the southern regions, to which he is approaching, then clothe themselves with tints deeper and more absorbent. It is therefore by adaptations of climate that Nature has made the inhabitants of the torrid zone black, as she has whitened those of the icy zones. She has given another preservative against the heat to the negroes of Africa, the hottest part of the globe, by reason of that broad belt of sand which crosses

it ; she has covered the heads of those careless tribes with a fleece more crisp than a tissue of wool, which shelters them from the burning heat of the sun. They are so sensible of this, that they never employ a head-dress, there being no description of mankind to whom artificial coverings are more rare than among the negroes. They use those of foreign nations merely as objects of vanity and luxury, and I do not know of any one that is peculiar to their nation.

The American tribes under the line are not black, but copper-coloured. I ascribe this weakening of the black tint to causes peculiar to their country. First, the universal practice of rubbing themselves over with *roucou*, (a kind of sweet-scented paste,) which preserves the skin from the too vehement impression of the sun. Secondly, they inhabit a woody country, crossed by the greatest river in the world, which covers it with vapours. Thirdly, their territory rises from the shores of Brazil to the mountains of Peru, which, giving it a greater elevation, procures a greater degree of coolness. Fourthly, the east winds, which blow there incessantly, contribute to that coolness.

✕ Finally, the colour of all those nations is so much the effect of climate, that the descendants of Europeans, settled there, assume the black tint after the lapse of some generations. This is perceptible in India, in the posterity of the Moguls, tribes derived from the extremity of Asia, whose name signifies *whites*, at this day as black as the nations they have conquered.

Tallness of stature no more characterizes species than difference of colour. A dwarf and a large apple-tree proceed from the same grafts. Nature, however, has rendered it invariable in the human species alone, because variety of magnitude would have destroyed, in the physical order, the proportions of man with the universality of her productions, and involved, in the moral order, consequences still more dangerous, by subjecting the smaller species of mankind to the greater.

✕ There are no races of dwarfs or giants. Those exhibited at fairs are little men contracted, or tall over-grown fellows, without proportion or vigour. They reproduce not themselves either in miniature or magnitude, whatever pains may have been taken by certain princes to procure a distinct propagation, among others by the late king of Prussia, Frederick II

✱ All nations have been, and still are, with little difference and very few exceptions, of the same stature. Formerly, we are told, there were real giants. The thing is possible; but this truth is become to us inconceivable, like all others of which Nature no longer furnishes any testimony. (If Polyphemuses, lofty as a tower, ever existed, every step they took in walking must, in most soils, have sunk into the ground. How could their long and clumsy fingers have milked the little she-goats, reaped the corn, mowed down the grass, picked the fruits of the orchard? The greatest part of our aliments would escape their eyes as well as their hands.)

✱ On the other hand, had there been generations of pigmies, how could they have levelled the forests to make way for the cultivation of the earth? They would have lost themselves among the rushes. Every brook would have been to them a river, and every pebble a rock.

On either of these suppositions all the relations of natural order are burst asunder, and such discords necessarily involve the utter destruction of all social order.

As much as Nature has affected variety in the species of animals of the same genus, though inhabiting the same regions, and subsisting on the same aliments, so much has she studied uniformity in the production of the human species, notwithstanding the difference of climate and of food. Man may degrade himself to the level of the beast, but never was his noble form dishonoured by the tail, the forked feet, and the horns of the brute. In vain is the attempt made to trace an approximation of man toward the class of mere animals, by insensible transitions.

There is a much greater difference still between the reason of man and that of beasts, than between their forms; the dullest of mankind can learn the use of fire, and the practice of agriculture, of which the most intelligent of animals is absolutely incapable. Agriculture is the art of Nature, and fire her primary agent. From experience we are assured, that men have acquired by means of this element, and of this art, an intelligence, of which all their other combinations are merely consequences. Our sciences and arts are principally derived from these two sources. The importance we assign to our talents proceeds not from their utility, but from our pride. We should take a material step toward its humiliation, did we consider that the animals which have no skill in

agriculture, and know not the use of fire, attain to the greatest part of the objects of our arts and sciences, and even surpass them.

✕ I say nothing of those which build, spin, manufacture paper, cloth, hives, and practise other trades, of which we have no knowledge. But the torpedo defended himself from his enemies by means of the electric shock, before academics thought of making experiments in electricity; and the limpet understood the power of the pressure of the air, and attached itself to the rocks, by forming the vacuum with its pyramidal shell, long before the air-pump was set a-going. The quails which annually go from Europe to Africa, have such a knowledge of the autumnal equinox, that the day of their arrival in Malta is marked on the almanacs of that island about the 22d of September, and varies every year as the equinox. The swan and wild duck know the latitude where they ought to stop, in reascending to the north, and easily find out the spot where the year before they made their nests. The frigate, which flies over vast oceans interrupted by no land, and regains at night the rock hardly emerging out of the water which he left in the morning, possesses means of ascertaining his longitude, hitherto unknown to our most ingenious astronomers.

Man, it has been said, owes his intelligence to his hands; but the monkey, the declared enemy of all industry, has hands too. The sloth likewise has hands, and they ought to have suggested to him the propriety of digging a retreat in the earth, for himself and his posterity, exposed as they are by the slowness of their progression. So far is the intelligence of an animal from depending on the structure of its limbs, that their perfection is frequently in the inverse ratio of its sagacity, and appears a kind compensation of Nature to make up a defect. To ascribe the intelligence of man to his hands, is to deduce the cause from the means, and talent from the tool with which it works.

✕ It is still more extravagant to maintain, that human reason depends on climate, because there are some shades of variety in manners and customs. The Turks cover their heads with turbans, we cover ours with hats; they wear long flowing robes, and we dress in coats with short skirts. In Portugal they drink off the sediment of wines, we throw it away. To all this I answer, that we would act as these people, if we

were in their country; and that they would act as we do, were they in ours.

Turbans and flowing robes are adapted to hot countries, where the head and body stands in need of being cooled, by enclosing in the covering of both a greater mass of air. Hence the use of turbans among the Turks, Persians, and Indians, of the mitres of the Arabians, of the sugar-loaf bonnets of the Chinese and Siamese, and that of wide and flowing robes, worn by most nations of the South. From a contrary necessity, northern nations, as the Polanders, Russians, and Tartars, wear furred caps and close garments. We are obliged to have, in our rainy climates, three aqueducts upon our head, and garments shortened, because of the dirt. Instances might be multiplied to show that the very varieties of national customs prove the consistency of human reason.

Climate has no greater influence in changing human morality, which is reason in perfection. I admit that extreme heat and cold produce an effect on the passions, and have remarked that the hottest days of summer, and the coldest of winter, were the seasons of the year when most crimes were committed. But I beg leave to add, that those seasons fertile in crimes, are so too of splendid actions. This effervescence of season acts on our senses like that of wine, producing an extraordinary impulsion, but indifferently to good and evil. Nature has implanted in us two powers, which ever balance each other in just proportion. When the physical sense, love, debases, the moral sentiment, ambition, raises us up again. The equilibrium necessary to the empire of virtue is never lost, except in persons debased by the habits of society, or of education. Then the predominant passion assumes the command of our faculties; but the fault is of society, which undergoes its punishment, and not that of Nature.

In every country, temperature of climate hastens or retards the expansion of all plants, and the gestation of all animals, the human race excepted: let this be carefully remarked. 'In the Antilles islands,' says Father du Tertre, 'the white women and the negresses go with child nine months, as in France.' I have made the same remark in all the countries through which I have travelled; and this observation demonstrates that the body of man is not subjected, in this respect, to the same laws with other animals. It manifests a moral intention in nature, to preserve an equilibrium in the popula-

tion of nations, which would have been deranged, had the pregnancy of the women been of shorter duration in hot countries than in cold. This intention is farther manifested in the admirable proportion she maintains between the number of males and females : it is compensated from north to south, so that if there be rather more women born to the south, there are rather more men to the north ; as if Nature meant to attract and unite remote nations, by means of inter-marriages.

× Climate influences, but does not determine, morality ; and though this supposed determination may be considered as the basis of the legislation of nations, no one philosophical opinion is more completely refuted by historic testimony. ‘Liberty,’ say they, ‘has found her asylum in the lofty mountains ; from the north it was that the haughty conquerors of the world issued forth. In the southern plains of Asia, reign despotism, slavery, and all the political and moral vices, which may be traced up to the loss of liberty.’

— There is in Europe a multitude of monarchical mountains, and many republics in plains. Each has, by turns, made trial of different sorts of government. Neither cold, nor ruggedness of soil, inspire men with the energy of liberty, still less with the unjust ambition of encroaching on that of others. The peasants of Russia, Poland, and Bohemia, have been slaves for ages ; whereas the Angrias and Mahrattas are free men and tyrants in the south. The Turks, who possess the finest provinces of Europe, issued from the mild climate of Asia. The timidity of the Siamese, and of most Asiatics, has been quoted ; but it is to be imputed to the multitude of their tyrants, rather than to the heat of their countries. The Macassars, who inhabit the island of Celebes, almost under the line, are possessed of a courage so intrepid, that a small number of them, armed with poniards only, put to flight the force under the command of Count Forbin, at Bancoek, consisting of Siamese and French, the former numerous, and the others armed with muskets and bayonets.

If from courage we make the transition to love, we shall find that climate has no more a determining power over man in the one case than in the other. In all countries love is a torrid zone to the heart of man. These appropriations of love to the nations of the south, and of courage to those of the north, have been imagined as effects of climate, applica-

ble only to foreign nations : but all these distinctions of temperament vanish into air before this simple question : Are the turtle-doves of Russia less amorous than those of Asia ; and are the tigers of Asia less ferocious than the white bears of Nova Zembla ?

Without seeking among men objects of comparison and contrast, from difference of place, we shall find more diversity in manners, opinions, habiliments, nay, in physiognomy, between an opera actor and a capuchin friar, than there is between a Swede and a Chinese. What a contrast is the deceitful Greek, fondly attached to life, to the honest Turk, ever devoted to death ! Their extraction, we shall be told, is not the same ; for pride, among us, ascribes a mighty influence to the power of blood. But the greatest part of those janissaries, so formidable to the cowardly Greeks, are frequently their own children given in tribute. But in what instance was an inclination to vice or virtue communicated with the blood ? Pompey, noted for his generosity, was the son of Strabo, infamously notorious for his avarice. Caligula, and Agrippina, the mother of Nero, were indeed brother and sister ; but they were the children of Germanicus, the darling hope of Rome. What a difference is even observable in the same man, between his youth and mature age : between Titus, stigmatized as a second Nero, in his youth, and Titus at his death, embalmed with the tears of the Senate and people of Rome, and transmitted to posterity as the delight of mankind ?

It is not climate, then, which regulates the morality of man ; it is opinion and education ; and which triumph not only over latitude, but even temperament. Neither place, climate, nation, family, temperament, determine men to vice or to virtue : they are everywhere free to choose.

Before we consider the evils men bring upon themselves, let us attend to those inflicted by the hand of Nature. It is demanded, Why should beasts of prey exist ? They are absolutely necessary. But for them the earth would be infested with cadaverous substances. There perishes annually, of a natural death, the twentieth part, at least, of quadrupeds, the tenth part of fowls, and an infinite number of insects. As the rains convey these spoils of the land to the rivers, and thence to the seas, on their shores it is that Nature has collected the animals destined to consume them. The fero-

cious animals descend by night from the mountains, to hunt for prey in this direction ; there are even several classes created expressly for such situations ; as the whole amphibious race ; for example, the white bear, the otter, the crocodile. In hot countries especially, where the effects of corruption are most rapid and dangerous, Nature has multiplied carnivorous animals. Legions of voracious crabs are nestled in their sands ; shell-fish, of innumerable species, pave the borders of their seas ; clouds of sea-fowls hover, with a loud noise, over their shallows, or sail round and round, at the discretion of the waves, in quest of food ; the whole species of cartilaginous fishes, which live only on flesh, such as the long shark, &c., and all the varieties of sea-dogs, swim there in crowds, constantly employed in devouring the wreck of bodies thrown upon the shore.

✕ The wrecks of all those bodies, after having served for food to the innumerable tribe of fishes, reduced at length into phlegms, oils, bitumens, and united to the pulps of vegetables, which descend from all quarters into the ocean, would reproduce in its waters a new chaos of putrefaction, did not the currents convey their dissolution to volcanoes, whose fires finish the process of decomposition, and give them back to the elements.

Animals of prey are by no means an object of terror to man, because most of them roam abroad only in the night. They announce their approach even before it is possible to perceive them. Some savour strongly of musk ; others have shrill and piercing voices, heard by night at a great distance ; others are distinguished by party-coloured spots or streaks, perceptible a great way off, on the yellow ground of their skin : all of them have eyes which sparkle in the dark.

After all, what is their ferocity to us ? Even supposing we were not provided with arms and sagacity far superior to all their cunning, Nature has given us dogs able to combat, nay, to subdue them ; and she has adapted their species to those of animals the most formidable. In the countries where lions are natives, dogs are likewise produced capable of engaging them in single combat.

The animals formidable to man are more to be feared from their smallness than their magnitude ; there are none, however, but what may be rendered subservient to his benefit. Serpents inhabit humid and unwholesome places, from which

they keep us at a distance, more by their hideous figures than their poisons. But there are noxious insects which prey upon our fruits, our corn, nay, our very persons. [If snails, May-bugs, caterpillars, and locusts, ravage our plains, it is because we destroy the birds of our groves which live upon them, and would clear our fields, provided the bird-catchers were laid under a prohibition to entrap them, as they do, by whole coveys, in their nets, not to immure them in cages, but to make food of them.

A fancy was adopted some years ago, in Prussia, to exterminate sparrows, as inimical to agriculture. Every peasant was subjected to an annual capitation tax of twelve heads of that bird, which were employed in the manufacture of saltpetre, for there nothing is suffered to go to waste. At the end of the second, or at farthest, of the third year, it was discovered that insects had devoured their crops, and it was found advisable to invite the sparrows from neighbouring countries, to repeople the kingdom with them. These birds, it is true, do eat corn, when the insects fail them; but these last, among others the weevil, consume the grain by bushels, nay, by whole granaries. If, however, it were possible to extinguish the whole race of insects, it would be the height of imprudence to set about it; for we should destroy, along with them, most of the feathered tribes of our plains, which have no other food for their young while in the nest.

As to the animals which fall upon our corn in the granary, and our woollens in the warehouse, such as rats, mice, mites, moths; I find that the former are useful in purifying the earth from human excrement, which constitutes a considerable part of their food. Besides, Nature has made man a present of the cat, to clear the interior of his habitation from those vermin. She has endowed this animal with uncommon agility, with wonderful patience and sagacity, and with a spirit of domesticity perfectly adapted to her employment.

The weevil and the moth commit great depredations among our grain and woollens; and it is said the common hen is sufficient to clear the granaries of them: we have, besides, the spider and the swallow, which destroy them when they take wing. I shall here consider only their political utility. On looking into those prodigious magazines where monopolizers hoard up the provision and clothing of a whole pro-

vince, are we not bound to bless the Hand that created the insect which obliges them to bring these necessary commodities to market? Were grain as incorruptible as gold and silver, it would soon become as scarce. The commonalty would be deprived of their subsistence, if it were as little susceptible of change as its representative. The mite and the moth first oblige the miser to employ many hands in stirring about and sifting his grain, till they force him at last to dispose of it altogether. How many poor wretches would go naked, if the moth did not devour the wardrobes and warehouses of the rich? It is most wonderful that articles of luxury are not liable to perish by insects, as those subservient to the most pressing wants of human life. It is possible to preserve coffee, silk, and cottons, even for ages; but in India, where they are real necessities of life, the insects quickly corrode them, particularly cotton stuffs.

The insects which attack the human body equally oblige the rich to employ domestics, to keep up cleanliness around them. The Incas of Peru exacted even this tribute of the poor; for in all countries these insects attach themselves to man, though it may have been said they did not pass the line. They are rather teasing than noxious, and draw off the bad blood. As they increase only in great heats, they invite us to bathe, so wholesome, yet so much neglected, because being expensive, it is become an object of luxury.

As to other calamities of Nature's inflicting, man feels their pressure because he deviates from her laws. If storms ravage his orchards and corn-fields, it is because he frequently places them where Nature never intended they should grow. Storms scarcely injure any culture except the injudicious cultivation of man. Forests and natural meadows never suffer in the slightest degree. Besides, they have their utility. Thunder-storms purify and cool the air. The hail, with which they are sometimes accompanied, destroys great quantities of hurtful insects; and hails are frequent only at the season when such insects hatch and multiply, in spring and summer. But for the hurricanes of the torrid zone, the ants and locusts would render the islands situated between the tropics totally uninhabitable.

I have already pointed out the absolute necessity of volcanoes, whose fires purify the sea, as those of thunder purify the air. Earthquakes proceed from the same cause. Nature

communicates previous notices of their effects, and where their foci are situated. The inhabitants of Lisbon know well that their city has been shattered by shocks of this kind, and that it is imprudent to build in stone. To persons who can submit to live in a house of wood, they have nothing formidable. Earthquakes are not universal; they are local and periodical.

As to the epidemical maladies of the human race, and the diseases of animals, they are, in general, to be imputed to the effects of the corruption of the waters, from which arise putrid exhalations that infect the air, vegetables, and animals. This may be charged, in almost every instance, on the injudicious labours of man. The most unwholesome regions of the earth are in Asia, on the banks of the Ganges, from which proceed, every year, putrid fevers, that in 1771 cost Bengal the lives of more than a million of men. They have for their focus the rice plantations, which are artificial morasses, formed along the Ganges, for the culture of that grain. After the crop is reaped, the roots and stalks, remaining on the ground, rot, and are transformed into infectious puddles, exhaling pestilential vapours. In the view of preventing these pernicious consequences, the culture of this plant has been prohibited in many parts of Europe, especially in Russia, round Otzchakof, where it was formerly produced in great quantities.

From the ancient miry canals of Egypt, the leprosy and pestilence are perpetually issuing forth. In Europe, the salt marshes of Brouage, which the sea-water no longer reaches, and in which the rain waters stagnate, because they are confined, are become constant sources of distemper among the cattle. Similar diseases annually issue from the canals of Holland.

The bad air of Rome, in summer, proceeds from the waters of its ancient aqueducts, which are diffused among the ruins, or have inundated the plains, the levels having been interrupted by the magnificent labours of the ancient Romans. The purple fever, dysentery, and small-pox, so common all over our plains, after the heats of summer, or in warm and humid springs, proceed from the puddles of the peasantry, wherein the refuse of plants putrefy. Many of our city distempers issue from the laystalls which surround them, and the cemeteries in and about our churches.

There would not have been a single unwholesome spot on earth, if men had not put their hands to it. The malignity of the air of St. Domingo, Martinico, Porto-Bello, and several districts of America, have been quoted, as a natural effect of climate ; but these places have been inhabited by savages, busied in diverting the course of rivers, and choking up rivulets, as essential to their defence. They imitate the beavers in the fortification of their villages, by inundating the adjacent country. I am the more induced to impute to the savages the corruption of the air, so murderous in some of the Antilles, that all the islands found uninhabited were exceedingly wholesome.

As the corruption of the air is a subject peculiarly interesting, I shall venture to suggest some simple methods, of remedying it. First, by substituting, in place of the stagnant puddles of our plains, the use of judiciously constructed cisterns, the waters of which are so salubrious. They are employed all over Asia. Care should be taken to prevent the throwing the bodies and other offal of dead animals into the laystalls of our cities ; they ought to be carried to the rivers, thereby rendered more productive of fish. In the case of cities which are not washed by rivers to carry off the garbage, or if this method is found otherwise inconvenient, attention should be paid, at least, to placing the laystalls only to the north and north-east of such cities, in order to escape, especially during summer, the fetid gusts which pass over them from the south and south-west.

Secondly, to abstain from digging canals. We are acquainted with the maladies resulting from those of Egypt, in the vicinity of Rome, and elsewhere, when care is not taken to keep them in repair.

Thirdly, the attempts made in France to dry the marshes, have cost many men, and frequently been left incomplete. From the bosom of rotten earth arise putrid emanations, scattering death among the workmen.

To remedy these inconveniences, I beg leave to observe, that a piece of land covered with water is never unwholesome ; it becomes so, only when the water evaporates, and exposes to the air the mud of its bottom and sides. The putridity of a morass might be remedied as effectually by transforming it into a lake, as into solid ground. Its situation must determine whether of these two objects is to be

preferred. If in a bottom, and without efflux, the indication of Nature ought to be followed up, and the whole covered with water. If there is not enough to form a complete inundation, ditches might be cut, and the stuff dug out thrown on the adjoining lands. Thus we should have canals always full of water, and little isles both fertile and wholesome.

Egypt avenges, by the pestilence of her canals, the oppression of the Turks, who prevent her inhabitants from keeping them in repair. [America, sinking under the accumulated strokes of Europeans, exhales from her bosom a thousand maladies fatal to Europe, and drags down with her the haughty Spaniard expiring on her ruins.] Thus the Centaur left with Deinira his empoisoned robe, as a present fatal to his conqueror: thus the miseries of mankind pass from huts to palaces, from the line to the poles, from age to age; and their long and lingering effects cry in the ears of the potentates of the earth—‘Learn to be just, and oppress not the miserable.’

Not only the elements, but reason itself corrupts in the haunts of wretchedness. What torrents of error, fear, superstition, discord, have broken out in the lower regions of society, and swelled to the terror and subversion of thrones! The more that men are oppressed, the more miserable are their oppressors, and the more feeble is the nation which they compose.

First, from the haunts of misery issue forth prostitutions, thefts, murders, and a multitude of physical evils besides, which, in all countries, are the plagues that tyranny produces. But those of opinion are much more terrible. One man subjugates another, not for his property, but to command his admiration, his reverence. Ambition proposes to itself no boundary short of this. However high his condition, or reduced that of his rival, let him have at his mercy the fortune, labour, wife, person of his adversary; he has gained no point unless he has gained his homage. Oppressors are thus the oppressed, becoming the arbiters of their own happiness; and the oppressed paying them back injustice for injustice, disturb them with false reports, religious terrors, &c., which engender among them jealousies, law-suits, duels, issuing in their total destruction. This reaction of evils upon each other, is in proportion to the ills they bring upon man-

kind. On contemplating this tremendous balance, we must acknowledge the existence of Sovereign Justice.

All governments are internally happy, and respectable abroad, which bestow on their subjects the right of acquiring fortune and honours: and the contrary takes place, when they reserve to a particular class of citizens the benefits which ought to be common to all. When human policy locks the chain round the ankle of a slave, Divine Justice rivets the other end round the neck of the tyrant.

[The author here enters at large into the benefits and disadvantages of every form of government, in which we lament the compass of our abridgment will not permit us to follow him. He points out the reaction of equity and felicity, of injustice and misfortune, and traces the calamities of society up to their very source. For the author's beautiful strain of reasoning on the subject, we refer the reader to the original work.]

Religion is now considered as the concern only of the vulgar, a mere political contrivance to keep them in order. Our philosophers oppose to it the philosophy of Socrates, Epictetus, and Marcus Aurelius, as if the morality of those sages were less austere than that of JESUS CHRIST, and the benefits to be expected from it better secured than those of the gospel! What profound knowledge of the heart of man; what wonderful adaptation to his necessities; what delicate touches of sensibility, are treasured up in that divine book! I leave its mysteries out of the question. Part of them, we are told, have been taken from Plato. But Plato himself borrowed them from Egypt, and the Egyptians were indebted for them to the Patriarchs. These mysteries are not more incomprehensible than those of Nature and of our own existence. Besides, in our examination of them we mislead ourselves. We want to penetrate to their source, and are capable only of perceiving their effects. Every supernatural cause is equally impenetrable to man, himself only an effect, a result, a combination for a moment. He cannot judge of divine things according to their nature, but to his own, and from the correspondence they bear to his necessities.

These testimonies of our weakness, these indications of our heart, being used in the study of religion, we shall find nothing worthy of that name on earth so perfectly adapted to the wants of human nature as the religion of the Bible. I say nothing

of the antiquity of its traditions. The poets of most nations have sung the creation, the indiscreet curiosity of the first woman, and the universal deluge, as if they had copied these histories from the book of Genesis.

To the Mosaic account of the creation, and the recent existence of the world, have been objected the antiquity and multiplicity of lavas in volcanoes. But have these observations been accurately made? Volcanoes must have emitted their fiery currents more frequently in the earlier ages, when the earth was more covered with forests, and the ocean, loaded with vegetable spoils, supplied more abundant matter to their furnaces. Besides, can we distinguish between what is old and modern in the structure of the world? The hand of creation must have manifested the impress of ages upon it from its birth. Were we to suppose it eternal, and abandoned to the laws of motion simply, the period must be long past, when there could not have been the smallest rising on its surface. The action of the rains, of winds, and of gravity, would have brought down every particle of land to the level of the seas.

It is not in the works of God, but of men, that we can trace epochs. Our monuments announce the late creation of the earth. If it were of high antiquity only, we should, surely, find some productions of human industry much older than three or four thousand years. We have substances on which time makes no very perceptible alteration. I have seen constellation-rings of gold, or Egyptian talismans, just come from the hand of the workman. Savages, who know not iron, are acquainted with gold, and search after it, as much for its durability, as for its shining colour. Instead, then, of finding antiques of only three or four thousand years, we ought to possess some of sixty, of a hundred, of two hundred thousand years.

Lucretius, who ascribes the creation of the world to atoms, on a system of physics altogether unintelligible, admits it to be quite a recent production.

If genial Nature gave the heavens no birth,
And from eternal ages roll'd the earth,
Why neither wars nor poets — sages, tell —
Till Homer sung how mighty Hector fell?

The religious traditions of our Scriptures serve as a founda-

tion to the religion of the Turks, Persians, and Arabians: they extend over the greatest part of Africa: we find them again in India, from whence all nations and all arts originally proceeded: we can trace them in the ancient religion of the Bramins;* in the history of Brama, or Abraham; of his wife Sarai, or Sara; in the incarnations of Wistnou, or of Christnou; in a word, they are diffused even among the savage tribes of America.

One of the monuments of our religion universally diffused, inexplicable on the principles of physics, proves a general deluge, by the wrecks of marine bodies scattered over the globe; another, irreconcilable to the laws of our politics, attests the reprobation of the Jews, dispersed, hated, despised, persecuted, without government or country; nevertheless, always numerous, subsisting, and tenacious of their law. Certain illustrious authors have stated these supernatural proofs of a Divine Justice, in a very striking light. I shall satisfy myself with adducing a few still more affecting, from their correspondence to Nature and the necessities of mankind.

The morality of the Gospel has been challenged, because JESUS CHRIST permitted a legion of demons to take possession of 2000 swine, which were precipitated into the sea and choked.—‘Why,’ ask the objectors, ‘ruin the proprietors of those animals?’ JESUS CHRIST acted in this as a legislator. The owners of the swine were Jews; they transgressed, therefore, the law which declares those animals unclean. But here again starts up a new objection, levelled at Moses, ‘Why are those animals pronounced unclean?’ Because, in the climate of Judea they are subject to the leprosy. But here is a fresh triumph to our wits. ‘The law of Moses,’ say they, ‘was, then, relative to climate, consequently, a mere political institution.’ To this I answer, that if I found, in either the Old Testament or the New, any usage not relative to the laws of Nature, I should be still more astonished. It is the character of a religion, divinely inspired, to be perfectly adapted to the happiness of man, and the laws enacted by the AUTHOR of Nature. From this want of correspondence false religions may be detected; and as to the point in question, the law of Moses, from its privations, was evidently intended to be the law of a particular people; whereas that

* See Rogers’s History of the Manners of the Bramins.

of the Gospel, from its universality, must have been intended for the whole human race.

Paganism, Judaism, Mahometanism, have all prohibited the use of certain species of animal food ; so that if one of those religions should become universal, it would produce either total destruction or unbounded multiplication, in evident violation of the plan of creation. The Jews and Turks proscribe pork ; the Indians of the Ganges reverence the heifer and the peacock. Not an animal exists but would serve as a feticha to some negro, or a manitou to some savage. The Christian religion alone permits the necessary use of all animals ; and prescribes abstinence from those of the land only at the season when they are procreating, and when those of the sea abound on the shores.

All religions have filled their temples with carnage, and immolated to DEITY the life of the brute creation. The Bramins themselves, so compassionate to beasts, present to their idols the blood and life of men. The Turks offer in sacrifice camels and sheep. Our religion, more pure, if we attend merely to the matter of the sacrifice, presents in homage to GOD bread and wine, the most delicious gifts bestowed on man. Nay, the vine is the most widely diffused of all fruit-trees ; corn is almost the only alimentary plant which thrives in all climates ; the liquor of the one, and the flour of the other, is capable of being preserved for ages, and transported to every corner of the earth.

All religions have admitted a plurality of women in marriage : Christianity but one. All have boasted of their genealogies, and, regarding with contempt most other nations, have permitted their votaries to reduce them to a state of slavery. Ours alone has protected the liberty of all men, calling them back to the same destination and origin. The religion of the Indians promises pleasure in this world ; that of the Jews, riches ; that of the Turks, conquests ; but ours enjoins the practice of virtue, and its reward heaven. Christianity alone knew our unbounded passions were of divine original. It has not limited love in the heart of man, to wife and children, but extends it to all mankind : it circumscribes not ambition to the sphere of a party, to the glory of one nation, but has directed it to heaven and immortality : our religion intended that our passions should minister as wings to our virtue. It diffuses charms ineffable over innocence,

and communicates a divine majesty to grief. So far from uniting us on earth, to render us miserable, she bursts the chains by which we are held captive. How many calamities has she soothed ! how many tears wiped away ! how many hopes inspired, when there was no longer room for hope ! how many doors of mercy thrown open to the guilty ! how many supports given to innocence ! If religion was designed only for the consolation of the miserable, it was of course designed to promote that of the human race !

Were the Christian religion producing universally its native effects, the earth would be a paradise. Christianity has abolished slavery in the greatest part of Europe. It wrested, in France, enormous possessions from the earls and barons, and destroyed a part of their inhuman rights by the terrors of a life to come. But the people opposed another bulwark to tyranny, viz. the power of the women.

Our historians remark the influence women have had under certain reigns, but never that of the sex in general. They are nothing in their eyes unless decorated with titles. It was, however, from this feeble division of society that Providence, from time to time, called forth those who have defended the nation from internal foes, more formidable than foreign assailants. Hear what the good Plutarch says on the subject : ‘ Before the Gauls had passed the Alps, and got possession of Italy, a violent sedition arose, which issued in a civil war. But their wives, the two armies being on the point of engaging, threw themselves into the intervening space, and taking up the cause of their dissension, discussed it with so much wisdom, moderation, and equity, that they gave complete satisfaction to both parties. The result was a unanimous return to cordial friendship, reuniting city to city, and family to family ; so that ever since they consult their wives respecting war or peace, and settle all differences with neighbours and allies conformably to the advice of the women.’

The power of the women proceeds from their oppression. The commonalty, as oppressed as they, gave them their confidence, as they had given theirs to the people. Both parties were wretched, but misery attracted them to each other. They decided equitably, as they had nothing to gain or lose. To the women we must ascribe the taste for rail-lery, which has at all times characterized our nation. With

a song simply they have often made our tyrants tremble, and by them ridicule has acquired a prodigious influence in France, though the armour only of the weak, because women are the first to use it; and as, from national prejudice, their esteem is the first of blessings, their contempt must be the most grievous calamity imaginable.

Cardinal Richelieu having restored to kings the legislative authority, thereby stripped the nobility of the power of injuring each other by civil wars; but he could not abolish their rage for duelling, because the root of this prejudice is in the people, and edicts have no power over their opinions when they are oppressed. The edict of the prince prohibits the gentleman to meet his antagonist in single combat, and the opinion of his *valet-de-chambre* forces him out. The nobility arrogate to themselves all the national honour, but the people determine the object of it, and allot its proportions. Gold, however, has levelled every rival influence, and triumphed over even the power of women.

As most men are shocked at abuses, only by seeing them in detail, because every thing great dazzles and commands respect, I shall here produce a few instances of the effect of venality in the lower orders of society. All the subaltern conditions which naturally rank under others, of right, are become the superiors, in fact, merely because they are the richer. Accordingly, it is the apothecary, now-a-days, who has the employing of the physician; the attorney of the advocate; the handicraft of the merchant; the master-mason of the architect; the bookseller of the scholar, even those of the academy; the chair-hirer in church of the preacher, &c. It is easy to see to what all this leads. From this venality alone must ensue the decline of all talents.

The nobility having preserved a part of their privileges in the country, trades-people, possessed of fortune, do not choose to live there, for fear of being exposed to insult or confounded with the peasantry. They like better to live in small cities, in indolence and listlessness, than to vivify the fields which degrade their cultivators. Hence small landed estates sink in value, and are falling into the hands of the great proprietors. If wealthy families were permitted to purchase the lands lying commodiously for them, such bargains would speedily become fatal to the state. I have often been astonished that there is no law in France to prevent the un-

bounded accumulation of landed property. The Romans had censors, who limited the extent of a man's possessions to seven acres, as being sufficient for the subsistence of one family. By the word *acre*, was understood as much land as a yoke of oxen could plough in one day. As Rome increased in luxury, it was extended to 500 : but even this law was soon infringed, and the infraction hurried forward the ruin of the republic.

Conquerors have always met with feeble resistance in countries where property is unequally divided. Overgrown estates destroy the spirit of patriotism in those who have every thing and those who have nothing. 'The shocks of corn,' said Xenophon, 'inspire those who raise them, with courage to defend them. The sight of them in the fields is as a prize exhibited in the middle of the theatre to crown the conqueror.'

Such is the danger to which excessive accumulation of property exposes a state outwardly ; but the internal mischief it produces among the citizens, and on the state of lands, is not less to be deplored. It is not upon the face of vast dominions, but in the bosom of industry, that the FATHER of mankind pours out the precious fruits of the earth.

Enormous property causes poverty all over the kingdom, for the very same reason which has procured it the eulogium of many of our writers, namely, that it spares men the labours of agriculture. In many places there is no employment for the peasantry during a great part of the year ; but I shall insist only on their wretchedness, which seems to increase with the riches of the district they inhabit.

The district of Caux is the most fertile country in the world. Agriculture, on the great scale, is there carried to the height of perfection ; but as the laws have there assigned in every family two-thirds of the landed property to the first-born, you find unbounded affluence on the one hand, and extreme indigence on the other.

I happened one day to be walking through this fine country, admiring as I went its plains, so well cultivated and so extensive, that the eye loses itself in the unbounded prospect. It was in the month of March, and very early in the morning. It blew extremely cold from the north-east. I perceived something red running across the fields, about a quarter of a league before me. I got up in time to see that they were two little girls in red jackets and wooden shoes,

who were scrambling through the ditch which bounded the road. The tallest, about six or seven years old, was crying bitterly. 'Child,' said I, 'what makes you cry, and whither are you going at so early an hour?' 'Sir,' replied she, 'my poor mother is very ill. There is not a mess of broth to be had in all our parish. We are going to that church in the bottom, to try if the cure of this parish can find us some. I am crying because my little sister is not able to walk any farther.' As she spake she wiped her eyes with a bit of canvass, which served her for a petticoat. On her raising up the rag to her face, I could perceive that she had not the semblance of a shift. The abject misery of the children, in the midst of plains so fruitful, wrung my heart. The relief which I could administer was small indeed. I myself was then on my way to see misery in other forms. Indeed the number of wretches in the best cantons of this province amount to a fourth, nay, to a third of the inhabitants in every parish; and many other provinces of the kingdom are incomparably worse than Normandy.

✱ The spirit of finance has accumulated all these woes on the heads of the people, by stripping them of the means of subsistence, and sapping the foundations of their morality. The people usually balance the vices of their oppressors by their own, opposing corruption to corruption. From the prolific womb of vulgar debauchery issue buffoons, comedians, dealers in luxury, nay, even men of letters, who, to flatter the rich, and save themselves from indigence, extend dissipation of manners and opinions to the extremity of Europe. In the class of the unmarried vulgar we find the most powerful bulwark opposed to rank and wealth. This numerous body comprehends not only the youth of both sexes, but those who, from peculiarity of condition, are deprived of the honours of society and the first pleasures of Nature; an association which has all reputations at their mercy, disturbing the peace of families at their will. These persons retail for a dinner that inexhaustible collection of anecdotes, favourable or unfavourable, which are in every instance to regulate public opinion.

A rich man cannot marry a handsome wife, nor enjoy himself at home in his own way; those persons oblige him, unless he would be laughed at, to make his wife the central point of all fashionable society; he must adopt the manners which his plebeian dictators prescribe, however contradictory to

Nature, however inconsistent with conjugal felicity. While they dispose of the reputation and pleasures of the rich, two of the columns attack their fortune in front; one employs intimidation, the other seduction.

My present reflections shall not be confined to the power and wealth acquired by several religious orders, but extend to their number in general. Politicians pretend that France would become too populous were there no convents in it. Are England and Holland over-peopled, where there are none? It betrays, besides, little acquaintance with the resources of Nature. The more inhabitants a country contains, the more productive it is. France could maintain, perhaps, four times more people than it now contains, if parcelled out into small freeholds. We must not form our judgment of its fertility from its immense domains. Those vast deserted districts yield only one crop in two years, or, at most, two in three. But with how many crops and men are small tenements covered! I have seen, in the same field, cherry-trees growing in potato-beds; vines clambering up the cherry-trees, and lofty walnut-trees rising above the vines; four crops, one above another, within the earth, upon the earth, and in the air, even in the meadow land of St. Gervais, near Paris. In a word every species of vegetable is there produced by the industry of cultivation.

Here a young rustic, with a basket and ladder, mounts a fruit-tree, like another Vertumnus; while some young girl, in the adjoining valley, sings her song loud enough to be heard by him, presenting the image of another Pomona. If cruel prejudices have stricken with sterility and solitude a considerable part of France, and have henceforth allotted the possession of a great kingdom to a little handful of proprietors, how is it that, instead of founders of new orders, founders of new colonies do not arise among us, as among the Egyptians and the Greeks? Shall France never have to boast of an Inachus and of a Danaus? Why do we force the African tribes to cultivate our lands in America, while our starving peasantry want employment at home? Why not transport thither our poor by families; children, old men, lovers, cousins, nay, the very churches and saints of our villages, that they may find in those far distant lands the loves and the illusions of a country. Ah! had liberty and equality been invited to those regions where Nature does so much with

moderate cultivation, the cottages of the New World would, at this day, have been preferable to the palaces of the Old.

Politicians consider war as necessary to a state, because, as they pretend, it takes off the superflux of mankind. In general they have a very limited knowledge of human nature. Independent of the resources of the subdivision of property, which multiplies the fruits of the earth, there is no country but what has the means of emigration within its reach, especially since the discovery of the New World. Besides, even the best peopled states contain immense tracts of uncultivated land. China and Bengal are, I believe, the countries on the globe which contain most inhabitants. In China, nevertheless, are many and extensive deserts, amidst its finest provinces, because avarice attracts their cultivators to the vicinity of great rivers and cities, for the conveniency of commerce. Many enlightened travellers have made this observation.

Generally to the excessive number of bachelors may be ascribed that of profligate women; they are in exact proportion to each other. This evil, too, is the effect of a natural reaction. As the two sexes are born and die in nearly equal numbers, every man comes into the world and leaves it in company with his female. He, therefore, who prefers celibacy to marriage, dooms a female to a single life. The ecclesiastical order robs the sex of so many husbands, and the social order deprives them of the means of subsistence; our manufactures and machinery have swallowed up almost all the arts by which they were formerly enabled to earn a livelihood. I do not speak of those who knit stockings, embroider, weave, &c. employments which in better times so many worthy matrons followed, but are now entirely engrossed by persons bred to the business; but we have, forsooth! tailors, shoemakers, male hair-dressers for the ladies. We have men-milliners, dealers in linen, gauze, muslin, gum-flowers. Men are not ashamed to assume the easy and commodious occupation, leaving to the poor women the rougher and more laborious. We have female dealers in cattle, in pigs; others who vend bricks and navigate barges; some even labour in quarries.

We meet multitudes in Paris sweating under an enormous load of linen, under heavy water-pails, blacking shoes on the quays; others yoked, like beasts, to little carts. Thus the sexes unsex themselves; the men dwindle into females, the

women harden into men. Females, in truth, would rather turn their charms to account than their strength. But what mischief is every day produced by women of the town ! What conjugal infidelity, what domestic plunder, do they occasion ! Scarcely has night begun to spread her curtain, when every street, every place of resort, swarms with them ; at every corner they lie in wait for their prey. Kept mistresses loll it away to the opera in magnificent equipages, every one of them bent on melting down a fortune. It is thus God punishes the oppressors of a people by the oppressed.

An attempt has lately been made to encourage virtue in our poor country girls, by festivals called *rose-feasts* ; when our Paris trades-people crown our rustic vestals, and *con-descend* likewise to permit the youthful peasants to eat at the same table with themselves for that day ; for the rich, and our city dames in business, do not put themselves on a level with the female peasantry, even at the foot of the altar. But you who bestow crowns on virtue, are you not afraid of blighting the prize by your touch ? Noble and generous effort ! They bestow a garland of roses upon indigent virtue in the country, while in the city vice flaunts about glittering with diamonds.

On the other hand, the punishments of guilt appear as injudiciously adjusted as the rewards of virtue. We too frequently hear these terrible words, *The sentence of condemnation !* but never, *The sentence of reward.* Crimes are repressed by infamous punishments. A simple brand inflicted, instead of reforming the criminal, frequently plunges him deeper in guilt, and often drives his family into vicious courses. Where can an unhappy wretch find refuge, who has been publicly whipped, branded, and drummed out ? Necessity has made him a thief ; indignation and despair will hurry him on to murder. His relations, dishonoured in the public estimation, abandon their homes, and become vagabonds. His sisters give themselves up to prostitution.

These effects of the fear which the hangman impresses on the lower orders, are considered as prejudices salutary to them, but they produce unspeakable mischief. The vulgar extend them to actions the most indifferent, and convert them into bitter aggravations of misery, not from a sense of honour, nor even from the shame of guilt, but only to the species of punishment. The decapitation of a man for trea-

son, or his being shot for desertion, are considered as no stigma on his family. The people, sunk below their level, despise that only which is peculiar to themselves, and show no pity in their decisions, because they are miserable.

The wretchedness of the lower orders is, therefore, the principal source of our physical and moral maladies. There is another, no less fertile in mischief, I mean the education of children. This branch of political economy engaged, among the ancients, the attention of the greatest legislators; with us education has no manner of reference to the constitution of the state. In early life are formed the inclinations and aversions which influence the whole of our existence. Our first affections are likewise the last; they accompany us through life, reappear in old age, and then revive the sensibilities of childhood with still greater force than those of mature age.

Wise Nature, in giving so much more force to early habits, intended that our happiness should depend on those most concerned to promote it — our parents; for on the affections they at that season inspire depends the affection we are one day called upon to return. But with us, as soon as the child is born, he is transferred to a mercenary nurse. The first bond Nature intended should attach him to his parents is burst asunder before it is formed. The day will come, perhaps, when he will behold the funeral procession of those who gave him birth leave his father's door with as much indifference as they saw his cradle turned out. He may be recalled home, it is true, at the age when the graces, when innocence, when the necessity of having an object of affection, should fix him there for ever. But he is permitted to taste those sweets only to make him feel, in a little while, the bitterness of losing them. He is sent to school, and boarded far from home. There he is doomed to shed tears which no maternal hand is ever more to wipe away; there he is to form friendships with strangers pregnant with regret and repentance; and there he must learn to extinguish the natural affections of brother, sister, father, and mother, the most powerful and the sweetest chains by which Nature attaches us to our country.

After this first horrid outrage committed on his young heart, others equally violent are offered to his understanding. His tender memory must be loaded with ablatives, conjunc-

tions, conjugations. The blossom of human life is sacrificed to the metaphysical jargon of a dead language. What Frenchman could submit to the torture of learning his own in that manner? And if there be those who have exercised such laborious patience, do they speak better than persons who have never endured such drudgery? Who writes best, a lady of the court, or a pedantic grammarian? To learn to speak by grammar rules, is the same thing with learning to walk by the laws of equilibrium. Practice teaches the grammar of a language, and the passions are our best instructors in the rhetoric of it. A period of life all fire and activity is thus repressed by an unnatural constraint, transforming it into a state, sad, sedentary, and speculative, which has a dismal influence on the temperament, by ingrafting upon it maladies without number.

Of love and ambition, the two moving principles of the human heart, the last is by far the most durable and dangerous. It dies last in the aged, and our education puts it prematurely in motion in the young. It would be infinitely better to assist them in directing their early tender affections toward an amiable object. Most men are destined to feel the power of this gentle passion, which Nature has made the firmest cement of society. If their age forbid a commerce of early love, their affections ought to be directed into the channel of friendship, and thus battalions of friends might be formed among them, prepared to devote themselves in the service of their country.*

Ambition, give it what specious name you please, is the sworn enemy of all virtue, the source of the most dangerous and detestable vices, every one being disposed to gratify it in his own way. It is forbidden by Nature and Religion. But emulation, we are told, awakens talents. It would be easy to demonstrate that the most celebrated writers, in every walk of literature, never were brought up at college, from Homer, acquainted with no language but his own, down to J. J. Rousseau, who was a very indifferent Latin scholar. How many young men have made a brilliant figure in the run of the classes, who were by and by totally eclipsed in the vast sphere of literature! Italy is crowded with colleges

* Children, at Sparta, were taught only to obey, to love virtue, to love their country, and to live in the most intimate union, till they were divided in their schools into two classes, of Lovers and Beloved.

and academies ; but can she boast, at this day, of so much as one man eminently distinguished ? Do we not see there, on the contrary, talents distracted, by ill-assorted societies, jealousies, cabals, intrigues, and ambition, become enfeebled and melt away ?

I think I perceive another reason of this decline ; nothing is studied in those seminaries but methods and forms of learning, or what is called *manner*. This study, by fixing us in the track of a master, forces us out of the path of Nature, the source of all talents. Observe the arts brought to the highest perfection in France, and you will find they are those for which there is no public school, no prize, no academy ; such as milliners, jewellers, hair-dressers, cooks, &c. We have, it is true, men of high reputation in the liberal arts, and in the sciences ; but these men acquired their talents before they were admitted into academies. But admitting that talents are formed in colleges, they would not for that be less prejudicial to the nation ; for it is more important that a country should possess virtue than talents, and that men should be happy than renowned. A treacherous glare covers the vices of those who succeed in our colleges. But in the multitude who never succeed, all the vices of a negative ambition are already in a state of fermentation, and prepared to burst forth, at the command of their leader, upon the world.

After having elevated a poor boy above his equals, by the title of emperor, and even above the whole human race, by that of son of the church, he is cruelly brought low by rigorous and degrading punishments.* I have seen, at college, many a pretty creature, ready to swoon with pain, receive on their little hands a dozen sharp strokes ; and by the infliction of this punishment, the skin separated from the tip of their fingers. What shall be said of those infamous punishments, which produce a disgraceful effect on the morals of both scholars and regents ? It is impossible to enter on this subject without putting modesty to the blush. And yet they are employed by priests !

Our children, subverted by the vices of a faulty education,

* Consult Montagne's Essays, book i. chap. 25.—Montagne was one of those men not educated at college. He was instructed without tasting corporal punishment, and without emulation, under the paternal roof, by the gentlest of fathers, and by preceptors whose memory he has preciousy embalmed in his writings. He became, by means of an education diametrically opposite to ours, one of the best and most intelligent men of the nation.

become false reasoners, knavish, hypocritical, envious, ugly, and wicked. In proportion as they increase in age, they increase also in malignity and the spirit of contradiction. Not a schoolboy knows any thing of the laws of his country, but some may have heard talk about those of the twelve tables. No one of them can tell how our own wars are conducted ; but many can entertain you with those of the Greeks and Romans. They all know single combat is prohibited ; yet many go to the fencing-schools, where the only thing taught is to fight duels.

Others, destined to functions more peaceful, are put to school to learn the art of disputation. Truth, we are gravely told, is struck out of the collision of opinions. Out of disputations have arisen sophisms, paradoxes, errors of every kind. Truth never shows her face before tyrants ; and every man who disputes would be a tyrant if he could. The light of truth has no resemblance to the fatal coruscations of thunder, but to the brightness of the sun when heaven is without a cloud.

I shall not follow our youth into the world, where he would be sufficiently unhappy, supposing him to have preserved only that fear of blame and desire of commendation under which his studies were conducted. Influenced by the opinion of another, himself possessing no steady principle, the silliest of women will rule over him with more unbounded empire than his professor. All I plead for is, that children should be delivered, at least, from that tedious apprenticeship of misery, by which they are depraved, at the happiest and most amiable period of their existence, and which has afterward so much influence on their characters. Man is born good, society renders him wicked, and our mode of education prepares the way for it.

Trace the history of a villain's life, and we shall find his infancy has been miserable. Where children were unhappy, I have observed them wicked and ugly ; but where I saw them happy, they were beautiful and good. In Holland and Flanders, where they are brought up with the greatest gentleness, their beauty is singularly remarkable. You never hear them, as in our cities, uttering loud and bitter cries ; still less are they threatened with the rod by their mothers and nurses ; they are not gay, but contented. You observe on their countenance an air of tranquillity and satisfaction

perfectly enchanting, and infinitely more interesting than the boisterous mirth of our young people, when they are no longer under the eye of their fathers or preceptors.

This calmness diffused over all their actions, is the source of a happy composure during their whole life. I never saw any country where parental tenderness was so strikingly expressed ; the children repay in their old age the indulgence with which they were treated in helpless infancy. By bonds so endearing are those people so powerfully attached to their country, that we find very few of them settling among strangers. With us, fathers like better to see children sprightly than good, because in an ambitious society, spirit raises man to the head of a party, but goodness makes dupes. They have epigrams composed by their children ; but wit being only the perception of the relations of society, children scarcely ever have any but what is borrowed. Wit itself is frequently, in them, the proof of a miserable existence, as may be remarked in the schoolboys of our cities, who usually are sprightlier than the children of the peasantry ; but in general they are all forward in point of feeling ; and this reflects great blame on those who degrade them, at an age when they feel more delicately than men.

Affecting instances of sensibility are not unfrequent in the children of the common people. Walking through the Pre St. Gervais, about the setting in of winter, I observed a poor woman, lying along the ground, weeding a bed of sorrel ; close by her was a little girl, of six years old at most, standing motionless and quite impurpled with the cold. I addressed myself to the woman, who was indisposed, and inquired into the nature of her malady. ‘Sir,’ said she, ‘for three months past, I have suffered severely from the rheumatism ; but my disease gives me less pain than that poor child does : she will not quit me a single moment. If I say to her, See, you are quite benumbed with cold, go and warm yourself ; she replies, Alas ! mother, if I leave you, your complaints will be your only companion.’

Another time, being in the park at Marly, I there found three children, two little girls, employed with singular activity in picking up the scattered sticks of dry wood, which they deposited in a basket, and a little boy, all in tatters, and extremely lean, devouring a morsel of bread. I asked the tallest what she intended to do with the wood ; she replied,

‘Look, sir, at that poor boy ; he is very miserable ! He is so unfortunate as to have a step-mother, who sends him out, all day long, to pick up wood : if he carries none home, he is beaten severely ; when he happens to have got a little, and is carrying it off, the Swiss at the park gate takes it from him, and applies it to his own use. He is half dead with hunger, and we have given him our breakfast.’ Having thus spoken, she and her companion filled the little basket ; helped him up with it on his back, and ran away before their unhappy friend to the gate of the park, to see if he could pass unmolested.

Foolish instructors ! Human nature, you tell us, is corrupted : yes, but you are the persons who corrupt it by contradictions, by unprofitable studies, by dangerous ambition, by shameful chastisements : and by an equitable reaction of Divine Justice, that feeble and unfortunate generation will one day give back to that which oppresses it, all the mischief which it first received.

STUDY EIGHTH.

REPLY TO THE OBJECTIONS AGAINST A DIVINE PROVIDENCE,
AND THE HOPES OF A LIFE TO COME, FOUNDED ON THE IN-
COMPREHENSIBLE NATURE OF GOD, AND ON THE MISERIES
OF A PRESENT STATE.

‘WHAT avails it me,’ some one will say, ‘that my tyrants are punished, if I am still to be the victim of tyranny ? Is it possible that such compensations should be the work of God ? Great philosophers, who have devoted their whole life to the study of Nature, have refused to acknowledge its Author. Who hath seen God at any time ? What is it that constitutes God ? But taking it for granted that an intelligent Being directs the affairs of this universe, man assuredly is abandoned to himself : no hand has traced his career : as far as he is concerned, there are, apparently, two Deities ; the one inviting him to unbounded enjoyment, and the other dooming him to endless privation ; one God of Nature, and another God of Religion. Man is left totally uncertain whether of the two he is bound to please ; and whatever be the choice which he

is determined to make, how can he tell whether he is rendering himself an object of love or of hatred?

‘His virtue itself fills him with doubts and scruples; it renders him miserable, both inwardly and outwardly; it reduces him to a state of perpetual warfare with himself, and with the world, to the interests of which he is obliged to make a sacrifice of himself. If he is chaste, the world calls him impotent; if religious, he is accounted silly; if he discovers benignity of disposition, it is because he wants courage; if he devotes himself for the good of his country, he is fanatic; if simple, he is duped; if modest, he is supplanted; everywhere he is derided, betrayed, despised, now by the philosopher, and now by the devotee. On what foundation can he build the hope of a recompense for so many struggles and mortifications? On a life to come? What assurance has he of its existence? Where is the traveller that ever returned from thence?

‘What is the soul of man? Where was it a hundred years ago? Where will it be a century hence? It expands with the senses, and expires when they expire. What becomes of it in sleep, in a lethargy? It is the illusion of pride to imagine it immortal: Nature universally points to death, in his monuments, in his appetites, in his loves, in his friendships: man is universally reduced to the necessity of drawing a veil over this idea. In order to live less miserable, he ought to *divert* himself, that is, as the word literally imports, he ought to *turn aside* from that dismal perspective of woes which Nature is presenting to him on every side. To what hopeless labours has she not subjected his miserable life? The beasts of the field are a thousand times happier; clothed, lodged, fed by the hand of Nature, they give themselves up without solicitude to the indulgence of their passions, and finish their career without any presentiment of death, and without any fear of an hereafter.

‘If there be a God who presides over the destiny of all, he must be inimical to the felicity of the human race. What is it to me that the earth is clothed with vegetables, if I have not the shade of a single tree at my disposal? Of what importance to me are the laws of harmony and of love, which govern Nature, if I behold around me only objects faithless and deceiving; or if my fortune, my condition, my religion, impose celibacy upon me? The general felicity diffused over

the earth, serves only as a bitter aggravation of my particular wretchedness. What interest is it possible for me to take in the wisdom of an arrangement which renovates all things, if, as a consequence of that very arrangement, I feel myself sinking, and ready to be lost for ever? One single wretch might arraign Providence, and say with Job the Arabian, chap. iii. 20, *Wherefore is light given to him that is in misery, and life unto the bitter in soul?* Alas! the appearances of happiness have been disclosed to the view of man, only to overwhelm him with despair of ever attaining it. If a God, intelligent and beneficent, governs Nature, diabolical spirits direct and confound at least the affairs of the children of men.'

I shall, first, reply to the principal authorities on which some of these objections are supported. They are extracted, in part, from a celebrated poet, and a learned philosopher, namely, Lucretius and Pliny.

Lucretius has clothed the philosophy of Empedocles and Epicurus in very beautiful verses. His imagery is enchanting; but that philosophy of atoms, which adhere to each other by chance, is so completely absurd, that wherever it appears, the beauty of the poetry is impaired. To what, we may ask him, do those primary atoms, out of which you construct the elements of Nature, owe their existence? Who communicated to them the first movement? How is it possible they should have given to the aggregation of a great number of bodies, a spirit of life, a sensibility, and a will, which they themselves possessed not?

✧ If you believe, with Leibnitz, that those *monads*, or unities, have perceptions peculiar to themselves, you give up the laws of chance, and must allow to the elements of Nature the intelligence you refuse to its AUTHOR. Descartes has subjected those impalpable principles to the laws of an ingenious geometry; and after him, the herd of philosophers, seduced by the facility of erecting all sorts of systems with the same materials, have applied to them, by turns, the laws of attraction, of fermentation, of crystallization; but all without success.

✧ Lucretius has thought proper to pursue a method still more strange, namely, (that in a work, the professed object of which is to materialize the Deity, he sets out with deifying matter.) He has given way to this universal principle, that we find it impossible powerfully to interest mankind, what-

ever be the object, without presenting to the mind some of the attributes of Deity. On this hypothesis, therefore, in his first book *De Rerum Natura*, he deifies Venus; ascribes to her the creation of the world; addresses prayers, and bestows on her person the epithet of sacred; he invests her with the character of goodness, justice, intelligence, and power, which belongs to God only; in a word, the attributes are so exactly the same, that, suppressing only the word Venus, in the invocation of his poem, you may apply it almost entirely to the Divine Wisdom. He is constrained to admit, in the sequel of his poem, that this goddess, so wonderfully beneficent, is directly chargeable with the ruin of health, of fortune, and, sooner or later, with the loss of reputation: that, from the very lap of the pleasures which she bestows, there issues a something which imbitters enjoyment, torments a man, and renders him miserable.

Pliny takes the directly opposite course. In the very threshold of his Natural History, he affirms there is no God, and the whole work is an elaborate demonstration of the being of God. His authority must be of considerable weight, as it is not that of a poet to whom opinions are a matter of indifference, provided he can produce a striking picture; nor that of a sectary, obstinately determined to support a party, whatever violence may be done to conscience; nor, finally, that of a flatterer, making his court to vicious princes. Pliny wrote under the virtuous Titus, and dedicated his book to him. He carries to such a height the love of truth, and contempt of the glory of the age in which he lived, as to condemn the victories of Cæsar, in Rome itself, and when addressing a Roman emperor. He is replete with humanity and virtue; and exposes the cruelty of masters to their slaves, the luxury of the great, nay, the dissolute conduct of several empresses. He sometimes pronounces the panegyric of good men; and exalts even above the inventors of arts persons who have rendered themselves illustrious by their continency, modesty, and piety.

His work is a combination of brilliancies, a real encyclopedia, containing the history of the knowledge and the errors of his time. These last are sometimes imputed to him unjustly, for he frequently brings them forward in the view of refuting them. The physicians and apothecaries, who have extracted many of their prescriptions from him, abuse

him, because he finds fault with their conjectural art and systematic spirit. He abounds, besides, in curious information, in profound views, and interesting traditions ; and what renders his performance invaluable, he uniformly expresses himself in a picturesque manner. With all this taste, judgment, and knowledge, Pliny is an atheist. Nature, from whom he has derived such various intelligence, may address him in the words of Cæsar to Brutus : *What, you too, my son !*

If I may be permitted to say it, in justification of Pliny, I believe his immortal work to be falsified, where he is made to reason as an atheist. All his commentators agree that no author has suffered more from the unfaithfulness of transcribers than he has done ; that copies of his Natural History exist in which whole chapters are entirely different. I shall here observe, that the writings of the ancients have passed through more than one unfaithful language, nay worse, more than one suspicious hand. They have met with the fate of their monuments, among which their temples have been most of all degraded. Their books have also been mutilated, chiefly in passages favourable to religion, or the reverse. An instance of this we have in the transcription of Cicero's Treatise on the Nature of the Gods, in which the objections against Providence are omitted.

Montagne upbraids the first Christians with having suppressed, on account of four or five articles which contradicted their creed, a part of the works of Cornelius Tacitus, ' though the emperor Tacitus, his relation, had, by his express edicts, furnished all the libraries in the world with them.'*

In our own days, every party exerts itself to run down the reputation and opinions opposed to it. Mankind is, in the hands of religion and philosophy, like the old man in the fable, between two dames of different ages. They had both a mind to trim his locks, each in her own way. The younger picked out all the white hairs, which she could not bear ; the old one, for an opposite reason, removed the black ; consequently his head was speedily reduced to complete baldness.

It is impossible to adduce a more satisfactory demonstration of this ancient infidelity of the two parties, than an interpolation to be found in the writings of Flavius Josephus, who was contemporary with Pliny. He is made to say, in so

* Essays, book ii. chap. xix.

many words, that the Messiah was just born ; and he continues his narration, to the end of a voluminous history, without once referring to this wonderful event. How can it be believed that Josephus, who frequently indulges himself in a tedious detail of minute circumstances, should not have reverted a thousand and a thousand times to a birth so deeply interesting to his nation, considering that its very destiny was involved in that event, and that even the destruction of Jerusalem was only one of the consequences of the death of JESUS CHRIST ? He, on the contrary, perverts the meaning of the prophecies which announce Him, applying them to Vespasian and Titus ; for he, as well as the other Jews, expected a Messiah triumphant. Besides, had Josephus believed in CHRIST, would he not have embraced his religion ?

For a similar reason, is it credible that Pliny should commence his Natural History with denying the existence of God, and afterwards fill every page of it with expatiating on the wisdom, goodness, providence, and majesty of Nature ; on the presages and premonitions, sent expressly from the gods ; and even on the miracles divinely operated through the medium of dreams ?

Certain savage tribes have been adduced as examples of atheism, and every sequestered corner of the globe has been for this purpose explored. But, obscure tribes were no more intended to serve as an example to the human race, than certain mean and obscure families among ourselves could be proposed as proper models to the nation ; especially when the object is to support by authority an opinion necessarily subversive of all society. Besides, such assertions are absolutely false. I have read the history of voyages from which they are extracted. The travellers acknowledge they had but a transient view of those people, and were totally unacquainted with their languages. They supposed there could be no religion among them, because they saw no temples ; as if any other temple were necessary to the belief in God than that of Nature ! These same travellers contradict themselves, by relating that those nations, elsewhere represented as destitute of all religion, make obeisance to the moon, by prostrating themselves to the earth, or lifting up their hands to heaven : that they pay respect to the memory of their forefathers, and place viands on their tombs. The immor-

tality of the soul, admitted how you will, necessarily supposes the existence of God.

But if the first of all truths stood in need of testimony from men, we could collect that of the whole human race, from geniuses the most exalted, down to the lowest state of ignorance. This unanimity of testimony is of irresistible weight ; for it is impossible that such a thing should exist on the earth as universal error.

Newton, who pursued his researches into the laws of Nature so profoundly, never pronounced the name of God without moving his hat, and otherwise expressing the most devout respect. He took pleasure in recalling this sublime idea, and considered it as the natural bond of union among all nations. Corneille le Bruyn,* the Dutch painter, relates, that happening to dine one day at his table, in company with several other foreigners, Newton, when the desert was served up, proposed a health to the men of every country who believe in God. This was drinking the health of the human race. A belief in God arises from the spectacle of Nature simply. A poor ignorant Arabian of the desert was one day asked, How he came to be assured there was a God ? 'In the same way,' he replied, 'that I am able to tell by the print impressed on the sand whether it was a man or a beast which passed that way.*'

Man, as has been said, cannot imagine any form, or produce a single idea, of which the model is not in Nature. He expands his reason only on the reasons Nature has supplied. God must, therefore, necessarily exist, were it but for this, that man has an idea of him. (But if we attentively consider that every thing necessary to man exists in a most wonderful adaptation to his necessities, for the strongest of all reasons God likewise must exist, He who is the universal adaptation of all the societies of the human race.

But I should wish to know, in what way those who doubt of his existence, on a review of the works of Nature, would desire to be assured of it ? . Do they wish he should appear under a human form, and assume the figure of an old man, as he is painted in some of our churches ? They would say, this is a man. Were He to invest himself with some unknown and celestial form, could we in a human body support the

* Travels through Arabia, by Mons. d'Arvieux.

sight? The complete and unveiled display of even a single one of his works on the earth would be sufficient to confound our feeble organs. For example, if the earth wheels around its axis, as is supposed, there is not a human being in existence, who, from a fixed point in the heavens, could view the rapidity of its motion without horror; for he would behold rivers, oceans, kingdoms, whirling about under his feet with a velocity almost thrice as great as a cannon-ball. But even the swiftness of this diurnal rotation is a mere nothing: for the rapidity with which the globe describes its annual circle, and hurls us round the sun, is seventy-five times greater than that of a bullet shot from the cannon. Were it but possible for the eye to view through the skin the mechanism of our own body, the sight would overwhelm us. Durst we make a single movement if we saw our blood circulating, the nerves pulling, the lungs blowing, the humours filtrating, and all the incomprehensible assemblage of fibres, tubes, pumps, currents, pivots, which sustain an existence at once so frail and so presumptuous?

Would we wish, on the contrary, that God should manifest himself in a manner more adapted to his own nature, by the direct and immediate communication of his intelligence, to the exclusion of every intervenient mean?

When some striking truth or affecting sentiment impresses an audience at a theatre, some are melted into tears, others almost choked with an oppressed respiration, others quite in a transport, clapping their hands, and stamping with their feet; the females in the boxes actually fainting away. Were these violent agitations of spirit to go on progressively but for a few minutes only, the persons subject to them might lose their reason, perhaps life. What would be the case, then, if the Source of all truth and feeling were to communicate himself to us in a mortal body? God has placed us at a suitable distance from his infinite Majesty; near enough to perceive, but not so near as to be annihilated by it. He veils intelligence under the forms of matter, and He restores our confidence respecting the movements of the material world by the sentiment of his intelligence. If at any time he is pleased to communicate himself in a more intimate manner, it is not through the channel of haughty science, but through that of modest virtue. He discloses himself to the simple, and hides his face from the proud.

‘But,’ it is asked, ‘what made God? Why should there be a God? Am I to call in question his existence because I am incapable of comprehending his origin? This style of reasoning would lead us to conclude that man does not exist: for, Who made man? Why should there be men? Why am I in the world in the eighteenth century? Why did I not arrive in some of the ages which went before? and, Wherefore should I not be here in those which are to come? The existence of God is at all times necessary, and that of men only contingent. Nay, the existence of man is the only apparently superfluous existence in the order established upon earth. Many islands have been discovered without inhabitants, which presented abodes the most enchanting, from the disposition of the valleys, of the waters, of the woods, of the animals. Man alone deranges the plans of Nature: he diverts the current from the fountain; he digs into the side of the hill; he sets the forest on fire; he massacres without mercy every thing that breathes; everywhere he degrades the earth, which could do very well without him.’

† The harmony of this globe would be partially destroyed, perhaps entirely so, were but the smallest genus of plants to be suppressed; for its annihilation would leave a certain space of ground destitute of verdure, and thereby rob of its nourishment the species of insect which there found the support of life. The destruction of the insect again would involve that of the species of bird which in these alone finds the food proper for their young; and so on to infinity. The total ruin of the vegetable and animal kingdoms might take its rise from the failure of a single moss, as we may see that of an edifice commence in a small crevice. But if the human race existed not, it would be impossible to suppose that any thing had been deranged: every brook, every plant, every animal, would always be in its place. Indolent and haughty philosopher, who presumest to demand of Nature wherefore there should be a God, why demandest thou not rather wherefore there should be men?

All his works speak of their AUTHOR. The plain which gradually escapes from my eye, and the capacious vault of heaven which encompasses me on every side, convey to me an idea of his immensity; the fruits suspended on the bough within reach of my hand, announce his providential care; the constant revolution of the seasons display his wisdom; the

variety of provision which his bounty makes, in every climate, for the wants of every thing that lives, the stately port of the forests, the soft verdure of the meadow, the grouping of plants, the perfume and enamel of flowers, an infinite multitude of harmonies, known and unknown, are the magnificent languages which speak of Him to all men in a thousand and a thousand different dialects. Nay, the very order of Nature is superfluous : God is the only being whom disorder invokes, and whom human weakness announces. In order to attain the knowledge of his attributes, we need only have a feeling of our own imperfections.

Man has given nothing to himself, he has received all.— But I should consider it an insult to the understanding of my reader, were I to insist longer on the proofs of the existence of God. I shall now reply to the objections against his goodness.

The laws which govern man are derived from the same plan of wisdom which has constructed the universe. Man is not a being of a nature perfectly simple. Virtue, which ought to be the great object of his pursuit on earth, is an effort which he makes over himself for the good of mankind, in the pleasing view of God only. It proposes to him the Divine Wisdom as a model, and presents the most secure and unerring path to happiness. Study Nature, and you will perceive that nothing can be more adapted to the felicity of man, and that virtue carries her reward in her bosom, even in this world.

Let us not complain that God has made an unfair distribution of his gifts, when we see the abundance in which bad men live. Whatever is on the earth most useful, beautiful, and best, is within the reach of every man. Obscurity is better than glory, and virtue than talents. The light of the sun, a little field, a wife and children, are sufficient to employ a succession of pleasures to him. Must he have luxuries too ? A flower presents him colours more lovely than the pearl dragged from the abysses of the ocean ; and a burning coal on his hearth has a brighter lustre, and is infinitely more useful, than the famous gem which glitters on the head of the Grand Mogul.

After all, What did God owe to man ? Water from the fountain, a little fruit, wool to clothe him, as much land as he is able to cultivate with his own hands. So much for the wants of his body. As to those of the soul, it is sufficient

for him to possess in infancy the love of his parents ; in maturity that of his wife ; in old age the gratitude of his children ; at all seasons the good will of his neighbours, the number of whom is restricted to four or five, according to the extent and form of his domain ; so much knowledge of the globe as he can acquire by rambling about for half a day, so as to get home to his own bed at night, or, at most, to the extremity of his domestic horizon ; such a sense of Providence as Nature bestows on all men, and which will spring up in his heart fully as well after he has made the circuit of his own field, as after returning from a voyage round the world.

With corporeal enjoyments and mental gratifications like these he ought to be content ; whatever more he desires is above his wants, and inconsistent with the distributions of Nature. He cannot acquire superfluity but by the sacrifice of some necessary ; public consideration he must purchase at the price of domestic happiness ; and a name in the world of science by renouncing his repose. Besides, these honours, attendants, riches, that submission, men so eagerly hunt after, are desired unjustly : a man cannot obtain them but by plundering and enslaving his fellow-citizens : their acquisition exposes to incredible labour and anxiety, the possession is disturbed by incessant care, and privation tears the heart with regret. By pretended blessings such as these, health, reason, conscience, all, is depraved and lost.

Virtuous persons, in truth, are sometimes destitute not only of the blessings of society, but of those of Nature. To this I answer, that their calamities frequently are beneficial to them. When persecuted by the world, they are usually incited to engage in some illustrious career. Affliction is the path of great talents, or of great virtues, which are infinitely preferable.

A resignation to the will of God ought in every situation to sooth the soul to peace. But if the illusions of a vain world should ruffle our spirit, let me suggest a consideration which may go far toward restoring our tranquillity. When any thing in Nature bears hard upon us, and inspires mistrust of its AUTHOR, let us suppose an order of things contrary to that which galls us, and we shall find a multitude of consequences resulting from this hypothesis that would involve much greater evils than those of which we complain. I

you wish to justify the order of Nature, it is sufficient to deviate from it; and, in order to refute all human systems, nothing more is necessary than to admit them.

For example, complaints are made of death: but if men were not to die, What would become of their posterity? Long before now there would not have been room for them on the earth. Death, therefore, is a benefit. Men complain of the necessity of labouring: but unless they laboured, How could they pass their time? The reputedly happy of the age, who have nothing to do, are at a loss how to employ it. Labour, therefore, is a benefit. Men envy the beasts the instinct which guides them: but if, from their birth, they knew, like them, all that they ever are to know, What should they do in the world? They would saunter through it without interest or curiosity. Ignorance, therefore, is a benefit.

The other ills of Nature are equally necessary. Pain of body and vexation of spirit are barriers erected by Nature to prevent our deviating from her laws. But for pain bodies would be broken to pieces on the slightest shock; but for chagrin the mind would become the victim of every sickly appetite. Diseases are the efforts of temperaments to purge off some noxious humour. Nature employs disease not to destroy the body, but to preserve it; it is ever the consequence of some violation of her laws, physical and moral. The remedy is frequently obtained by leaving her to act in her own way. The regimen of aliments restores our health of body, and that of men, tranquillity of mind. Whatever opinions disturb our repose in society, they almost always vanish in solitude. Sleep itself dispels our chagrin more gently and infallibly than a book of morals. If our distresses are such as to break our rest, they may be mitigated by having recourse to God. Here is the central point towards which all the paths of human life converge. Prosperity, at all seasons, invites us to his presence, but adversity leaves us no choice.

The evils of society are no part of the plan of Nature, but they demonstrate the existence of another order of things: for is it natural to imagine, that the BEING good and just, who has disposed every thing on earth to promote the happiness of man, will permit him to be deprived of it without punishing the wretch who dared to counteract his gracious designs? Will He do nothing in behalf of the virtuous but

unfortunate man, whose constant study was to please him, when he has loaded with blessings so many miscreants who abuse them? After having displayed a bounty which has met with no return, will he fail in executing necessary justice?

‘But,’ we are told, ‘every thing dies with us. Here we ought to believe our own experience; we were nothing before our birth, and we shall be nothing after death.’ I adopt the analogy; but if I take my point of comparison from the moment I was nothing, and when I came into existence, what becomes of this argument? Is not one positive proof better than all the negative proofs in the world? You conclude from an unknown past to an unknown future to perpetuate the nothingness of man; and I, for my part, deduce my consequence from the present which I know, to the future which I do not know, as an assurance of this future existence. I proceed on the presumption of a goodness and a justice to come, from the instances of goodness and justice which I see actually diffused over the universe.

Besides, if we have in our present state the desire and presentiment only of a life to come; and if no one ever returned thence to give us information concerning it, the reason is, a proof more sensible would be inconsistent with the nature of our present life on the earth. Evidence on this point must involve the same inconveniences with that of the existence of God. Were we assured by some sensible demonstration that a world to come was prepared for us, I have the fullest conviction that all the pursuits of this world would from that instant be abandoned. The passage from the one world to the other being in every man’s power, the gulf would be quickly shot: but Nature has involved it in obscurity, and planted doubt and apprehension to guard the passage.

It would appear, we are told by some, that the idea of the immortality of the soul could arise only from the speculations of men of genius, who, considering the combination of this universe, and the connexion which present scenes have with those which preceded them, must have thence concluded that they had a necessary connexion with futurity; or else that this idea of immortality was introduced by legislators to console mankind under the pressure of their political injustice. But if this were the case, how could it have found its way

into the deserts, and been diffused at once, over the islands of the South Seas and Lapland, over Asia and North America, among the inhabitants of Paris and those of the New Hebrides? How is it possible that so many nations, separated by vast oceans, so different in manners and in language, should all believe in the immortality of the soul? Whence could they have derived a belief so flatly contradicted by their daily experience? They every day see their friends die, but the day never comes when any one reappears.

Shall we be told that pride cherishes this fond opinion in their breasts? What, is it pride that induces a wretched negro in the West Indies to hang himself, in the hope of returning to his own country, where a second state of slavery awaits him? Other nations, such as the islanders of Otaheite, restrict the hope of this immortality to a renovation of precisely the same life they are going to leave. Ah! the passions present to man far different plans of felicity; the miseries of his existence, and the illumination of his reason, would long ago have destroyed the life that is, had not the hope of a life to come been, in the human breast, the result of a supernatural feeling.

But wherefore is man the only one of the animals subjected to other evils than those of Nature? Wherefore should he have been abandoned to himself, disposed as he is to go astray? He is, therefore, the victim of some malignant being.

It is the province of religion to take us up where philosophy leaves us. The nature of the ills we endure unfolds their origin. If man renders himself unhappy, it is because he would himself be the arbiter of his own felicity. Man is a god in exile. The reign of Saturn, the Golden Age, Pandora's box, from which issued every evil, at the bottom of which hope only remained: a thousand similar allegories, diffused over all nations, attest the felicity and the fall of a first man.

But there is no need to have recourse to foreign testimonies. We carry the most unquestionable evidence in ourselves. The beauties of Nature bear witness to the existence of God, and the miseries of man confirm the truths of religion. Animals are lodged, clothed, fed, by the hand of Nature, without care, and almost without labour. Man alone is overwhelmed with calamity. First, he is born naked;

and is possessed of so little instinct, that if his mother were not to rear him for several years he would perish of hunger, heat, or cold. He knows nothing but from the experience of his parents. They must find him a place to lodge, weave garments for him, provide his food for eight or ten years. Encomiums have been passed on certain countries for their fertility and mildness of climate, but I know of none where subsistence of the simplest kind does not cost man solicitude and labour. In India he must be sheltered from heat, from rain, and from insects. He must there cultivate rice, weed, thrash, shell, and dress it. The banana, useful as it is, must be watered and hedged round, to secure it from the wild beasts. Magazines of provisions must be provided during those seasons when the earth produces nothing. When man has thus collected around him every thing necessary to a quiet and comfortable life, ambition, jealousy, avarice, gluttony, incontinency, or langour, take possession of his heart. He perishes, the victim of his own passions. Undoubtedly to have sunk thus below the level of the beasts, man must have aspired at an equality with the DEITY.

Wretched mortals ! Seek your happiness in virtue, and you will have no ground of complaint against Nature. Despise that useless knowledge, those unreasonable prejudices, which have corrupted the earth, and which every age subverts in its turn. Love those laws which are eternal. Your destiny is not abandoned to chance, nor to mischievous demons. Recall those times, the recollection of which is still fresh among all nations. The brute creation everywhere found the means of supporting life ; man alone had neither aliment, nor clothing, nor instinct.

Divine Wisdom left man to himself, in order to bring him back to God. She scattered her blessings over the earth, that to gather them he might explore every region of it ; that he might expand his reason by the inspection of her works, and that he might love her from a sense of benefits. She placed between herself and him harmless pleasures, rapturous discoveries, pure delights, and endless hopes, to lead him to herself through the path of knowledge and happiness. [She fenced his way on both sides, by fear, languor, remorse, pain, and all the ills of life, as boundaries destined to prevent him from losing himself. The mother thus scatters fruit along the ground to induce her children to learn to walk ;

she keeps at a little distance, smiles, calls, stretches out her arms towards him ; but if he happens to fall, she flies to his assistance, wipes away his tears, and comforts him.

Thus Providence relieves man, supplying his wants in a thousand extraordinary ways. What would have become of him in the earliest ages, had he been abandoned to his own reason, still unaided by experience ? Where found he corn, a principal part of the food of so many nations, and which the earth, while it spontaneously produces all sorts of plants, nowhere exhibits ? Who taught him agriculture, an art so simple that the most stupid of mankind is capable of learning it, and yet so sublime, that the most intelligent of animals can never pretend to practise it ? There is scarcely an animal but what supports its life by vegetables, no one but what has daily experience of their reproduction, and does not employ, in quest of those that suit him, many more combinations than would have been necessary for resowing them.

But on what did man himself subsist till an Isis or a Ceres revealed to him this blessing of the skies ? Who showed him, in the first ages of the world, the original fruits of the orchard, scattered over the forest, and the alimentary roots concealed in the bosom of the earth ? Must he not have died of hunger before he had collected a sufficiency to support life, or perished by poison before he had learned to select, or sunk under fatigue or restlessness before he had formed round his habitation grass-plots and arbours ? This art, the image of creation, was reserved for that being alone who bore the impression of the Divinity.

If Providence had abandoned man to himself, on proceeding from the hands of the Creator, what would have become of him ? Could he have said to the plains : Ye unknown forests, show me the fruits, my inheritance ? Earth, open, and disclose, in the roots buried under thy surface, my destined aliment ? Ye plants, on which my life depends, manifest to me your qualities, and supply the instinct which Nature has denied ? Could he have had recourse, in his distress, to the compassion of the beasts, and, ready to perish with hunger, have said to the cow : Take me into the number of thy children, and let me share, with thy offspring, the produce of one of thy superfluous teats ? When the north wind made him shiver with cold, would the wild goat and timid sheep have run at his call to warm him with their fleeces ? Wandering,

without a protector or asylum, when he heard by night the howlings of ferocious animals demanding their prey, could he have made supplication to the generous dog, and said to him : Be thou my defender, and I will make thee my slave ? Who could have subjected to his authority so many animals which stood in no need of him, which surpassed him in cunning, in speed, in strength, unless the hand which, notwithstanding his fall, destined him still to empire, had humbled their heads to the obedience of his will ?

How was it possible for him, with reason less infallible than their instinct, to raise himself up to the heavens, measure the course of the stars, cross the ocean, call down the thunder, and imitate most of the works and appearances of Nature ? We are astonished at these things now ; but I am much rather astonished that a sense of Deity should have spoken to his heart long before a comprehension of the works of Nature had perfected his understanding. View him in the state of nature, engaged in perpetual war with the elements, with beasts of prey, with his fellow-creatures, with himself ; frequently reduced to situations of subjection no other animal could possibly support ; and he is the only being who discovers, in the very depth of misery, the character of infinity, and the restlessness of immortality. He erects trophies, engraves the record of his achievements on the bark of trees, celebrates his funeral obsequies, and puts reverence on the ashes of his forefathers, from whom he has received an inheritance so fatal.

Agitated by the rage of love or vengeance, when he is not the victim of his fellow-men, he is their tyrant : and he alone knows that justice and goodness govern the world, and that virtue exalts man to heaven. He receives from his cradle none of the presents of Nature, no soft fleece, no plumage, no defensive armour, no tool, for a life so painful and so laborious ; and he is the only being who invites the gods to his birth, to his nuptials, and to his funeral obsequies.

However far he may have been misled by extravagant opinions, as often as he is struck by unexpected bursts of joy or grief, his soul, by an involuntary movement, takes refuge in the bosom of Deity. He cries out : Ah, my God ! He raises to heaven suppliant hands, and eyes bathed with tears, in hope of there finding a father. Ah ! the wants of man bear witness to the providence of a Supreme Being. He has made

man feeble and ignorant, only that he may stay himself on his strength, and illuminate himself by his light; and so far is it from being true, that chance or malignant spirits domineer over a world, where every thing concurred to destroy a creature so wretched, his preservation, his enjoyments, and his empire, demonstrate that, at all times, a beneficent God has been the friend and protector of human life.

STUDY NINTH.

OBJECTIONS AGAINST THE METHODS OF OUR REASON, AND THE PRINCIPLES OF OUR SCIENCES.

I HAVE hitherto displayed the immensity of the study of Nature, and proposed new plans to assist our idea of the order established in her various kingdoms: but, checked by my own incapacity, all I could presume to promise was a slight sketch of what exists in the vegetable order. Before I proceeded to lay down new principles on this subject, I thought myself called upon to refute those prejudices which the world and our sciences might have diffused over Nature.

I have combated our natural sciences as far only as system is concerned: I give them full credit on the side of observation. Besides, I highly respect those who devote themselves to the pursuit of science. I know nothing more estimable, next to the virtuous man, than the man of real knowledge, if it be possible to separate the sciences from virtue. What sacrifices does not the cultivation of them demand! While the herd of mankind is growing rich and renowned by agriculture, commerce, navigation, and the arts, those who cleared the way for the rest lived in indigence, unknown to, and disregarded by, their contemporaries. The man of science, like the torch, illuminates all around him, and remains himself in obscurity.

I have attacked neither the learned, whom I honour, nor the sciences, my consolation through life: but had time permitted, I would have disputed every inch of ground with our methods and systems. They have thrown us into such a variety of absurd opinions, in every branch of scientific research, that our libraries contain more error than information. The

mischief they produce might easily be checked, by arranging side by side all the books which contradict themselves ; and as these are almost infinite in number, the result of human knowledge, as far as they convey it, will be reduced almost to nothing.

Our very methods of acquiring knowledge delude us into error. To succeed in the search of truth we ought to be exempted from the influence of passion ; and yet, from infancy, the passions are wilfully set afloat, and reason receives an improper bias. This maxim is laid down as the fundamental basis of all conduct and opinion, *Make your fortune*. The effect is, we prize nothing but what relates to this appetite. Even natural truths vanish, because we no longer contemplate Nature, except in machines or books.

That we may believe in God, some person of consequence must assure us there is one. If Fenelon says it is so, we admit it, because he was preceptor to the Duke of Burgundy, an archbishop, a man of quality, and addressed by the title my lord. We are convinced of the existence of God by the arguments of Fenelon, because his credit reflects some upon ourselves. I do not mean to affirm that his virtue contributed nothing to the force of his reasoning : but no farther than as it is connected with his reputation and fortune ; for were we to meet this same virtue in a water-porter, its lustre would fade in our eyes. To no purpose would such a one furnish proofs of the existence of a God, more unanswerable than all the speculations of philosophy, in a life labouring under contempt, exhibiting uniform probity and fortitude, and passed in perfect resignation to the will of the Supreme : these testimonies are of no consideration with us ; we estimate their importance from the celebrity they have acquired.

But should a period come, when men of high reputation, in favour with powerful princes, deny the existence of God ; from the same effect of our education, which engaged us to believe in Him, on the faith of Fenelon, we would renounce our belief on the credit of the others. Thus our education warps us, disposing us indifferently to preach the Gospel or the Alcoran, according as they best suit our interest.

Most of the laws we have presumed to assign to Nature have been deduced from our weakness or pride. We have settled it, for instance, that the sun must be in the centre of the planets, to regulate their motion, because we place our

selves in that of our personal concerns, to keep an eye over them. But if, in the case of the celestial spheres, the centre naturally belongs to the most considerable bodies, how comes it that Saturn and Jupiter, much larger than our globe, should be at the extremity of our vortex ?

I do not reject our planetary system, such as it is given us ; but I admit it for the reason which at first suggested it, from its being best adapted to the weakness of my body and mind. I find that the daily rotation of the earth saves the sun a prodigious journey ; but, in other respects, I do not believe this system is that of Nature, nor that she has disclosed the causes of motion to men, incapable of accounting for the movement of their own fingers.

I beg leave to suggest some farther probabilities in favour of the sun's motion round the earth. 'The astronomers of Greenwich having discovered that a star of Taurus has a declination of two minutes every 24 hours ; that this star not being dim, and having no train, cannot be considered as a comet, communicated their observations to the astronomers of Paris, who found them accurate. M. Messier was appointed to make a report of this to the Academy of Sciences at their next meeting.'*

If the stars are suns, here then is a sun in motion, a presumption, at least, that ours may move.

The stability of the earth may be presumed, because the distance of the stars never changes with respect to us, which must perceptibly take place, if we performed every year, as is alleged, a round of 64,000,000 of leagues in diameter through the heavens ; for in a space so vast, we must draw nigher to some, and remove from others.

Sixty-four millions of leagues, we are told, dwindle to a point in the heavens, compared to the distance of the stars. I doubt the truth of this. The sun, a million of times greater than the earth, presents an apparent diameter of only six inches, at the distance of 32,000,000 of leagues. If this distance reduces so immense a body to a diameter so small, doubtless double the distance would still diminish and reduce it, perhaps to the apparent magnitude of a star ; that, on being thus diminished, and our still removing 64,000,000 of leagues farther, he would entirely disappear. How comes

* Extract from the *Courier de l'Europe*, Friday, 4th May, 1781.

it to pass, then, that when the earth approaches, or removes to this distance from the stars, in performing its annual circle, no one of those stars increases or diminishes in magnitude with respect to us?

I submit some farther observations, tending to prove that the stars have, at least, motions peculiar to themselves. Ancient astronomers observed, in the neck of the Whale, a star which presented much variety in its appearances; sometimes it appeared for three months together, sometimes longer; sometimes its apparent magnitude was greater, sometimes smaller: the time of its appearances was irregular. The same astronomers observed a new star in the heart of the Swan, which from time to time disappeared. In the year 1603, it was equal to a star of the first magnitude: it gradually diminished, and at length disappeared. M. Cassini perceived it in 1655. It increased for five years successively, then began to decrease, and reappeared no more. In 1670 a new star was observed near the head of the Swan, by Father Anselm and several other astronomers. It disappeared, and became again invisible in 1672. From that period it was seen no more till 1709, and in 1713 it totally disappeared.

These examples demonstrate, that the stars not only have motions, but describe curves very different from the circles and ellipses we have assigned to heavenly bodies. I am persuaded there is among these the same variety of motion, as between that of many terrestrial bodies; and that stars describe cycloids, spirals, and other curves, of which we have no idea.

I must proceed no farther on this ground, for fear of appearing better informed respecting the affairs of heaven than those much nearer us. I only intended to expose my doubts and ignorance. If stars are suns, then there must be stars in motion, and surely ours may be in motion, as well as they are.

Thus our general maxims become the sources of error; for we charge with disorder whatever seems to recede from our pretended order.

It is a maxim, that a man of genius catches every thing at a glance, and executes all by one single law; but I consider this sublime method of observing and executing, as one of the strongest proofs of the weakness of the human mind. Man cannot proceed with confidence but in one single path; should a variety present themselves, he becomes perplexed,

and is at a loss which he ought to pursue : that he may not deviate, he admits only one to be right ; and once engaged, right or wrong, pride stimulates him forward. The AUTHOR of Nature, on the contrary, embracing the spheres of all beings, produces them by laws various as his own inexhaustible conceptions, to accomplish one single end, their general good ; and it is well worthy of remark, that the only end He discloses to our understanding, is the same with that he proposes to our virtue.

In the last age, every thing was explained on the principles of corpuscular philosophy, because it was perceived that some bodies were formed by intus-susception, or an aggregation of parts ; but being indifferently endowed, its reign was of short duration. Others having found that air pressed, set to work to demonstrate its gravity. Our books referred every thing to the gravity of the air ; they investigated its elasticity, and explained equally well all the operations of Nature by this quality of the air. The universal cry was, now the veil is removed ; we have caught her in the fact. But did not the savage know, when walking against the wind, that air had both gravity and elasticity ? Did he not employ both those qualities in managing his canoe when under sail ? I do not object to investigation, if natural effects are applied to the necessities of human life ; but they are introduced only to regulate the operations of Nature, and not our own.

Others explain the system of the universe, by ascribing to it laws which have so much accuracy and precision, that Divine Providence has nothing more to do. They represent him as a geometrician, or mechanist, who amuses himself with making spheres, merely for the pleasure of spinning them round. They pay no regard to harmonies and other moral causes. Though their observations may do them honour, the results are unsatisfactory. Their reasoning on Nature resembles that of a savage, who, on observing, in one of our cities, the motion of the indexes of a public clock, and seeing, that on their pointing in a certain direction upon the hour-plate, the turrets fell a shaking, crowds issued into the streets, and many of the inhabitants were put in motion, should thence conclude, that a clock was the principle of all European occupations. [This is the defect of the sciences, which, without consulting the end of the operations of Na-

ture, perplex themselves in an unprofitable investigation of the means.

✕ The gods of the ancients impressed upon them some respect for the works of creation, and attached them to their country by a sentiment of religion. But our machinery destroys the harmonies of Nature and Society. The first is to us only a gloomy theatre, composed of levers, pulleys, weights, and springs; the second merely a school for disputation. Those systems, we are told, give exercise to the mental faculties. It may be so; but may they not mislead the understanding and deprave the heart? While the head is laying down principles, the heart deduces consequences. If every thing is the production of unintelligent powers, of attractions, of fermentations, the play of fibres, of masses, we are then subjected to their laws, as all other bodies are. Women and children deduce these consequences. What, in the meantime, becomes of virtue? You must submit, say these ingenious gentlemen, to the laws of Nature. So then, we must obey the power of gravity; sit down, and walk no more. Nature speaks by a hundred thousand voices. Which of these is now sounding in our ears? What! will you adopt as the rule of life, the example of fishes, quadrupeds, plants, or even of the heavenly bodies?

Metaphysicians, who pay no regard to the laws of physics, explain the system of the universe, by means of abstract ideas; a proof their system is not that of Nature, is, that with their materials and method, it would be easy to subvert their order, and frame another totally different from it. Hence a reflection arises, which levels a mortal blow at the pride of human understanding; all these efforts of the genius of man, so far from being able to construct a world, are incapable of putting a grain of sand in motion.

✕ Others consider the state we live in as that of progressive ruin and punishment. They suppose, conformably to the authority of the sacred writings, that this earth once existed with other harmonies. I readily admit what scripture says on this subject, but I object to the explanations of commentators. Such is our intellectual weakness, that we cannot conceive or imagine any thing beyond what Nature actually exhibits to us. ✕ They are mistaken, when they affirm, for instance, that when the earth was in a state of perfection, the sun was constantly in the equator; that the days and nights

were perpetually equal ; that there was an eternal spring ; that the whole face of the ground was smooth, level, and so on.

✕ Were the sun constantly in the equator, I question whether a single spot of the globe would be habitable. First, the torrid zone would be burned up, as has been already demonstrated ; the icy zones would extend much farther than at present ; the temperate zones would be at least as cold toward their middle, as they are with us at the vernal equinox ; and this temperature would prevent the greatest part of fruits from coming to maturity. I know not where the perpetual spring would be ; but, if it could anywhere exist, never could autumn exist there likewise. The case would be still worse were there neither rocks nor mountains on the surface of the globe ; for not one river, nay not a brook of water, would flow over the whole earth. There would be neither shelter nor reflex, to the north, to cherish the germination of plants ; neither shade nor moisture, to the south, to preserve them from the heat. These wonderful arrangements actually exist over the whole northern regions, which become loaded with rocks as the latitude increases ; and they rise in all the islands and districts between the tropics, where the ground is covered with rocks, especially toward the line ; in Ethiopia, which Nature has overspread with vast and lofty rocks, which form deep valleys, delightfully shady and cool. Thus, in order to refute our pretended plans of perfection, it is sufficient to admit them.

The botanists, another class of literati, on the contrary, never deviate from their track, and abstain from looking at any thing beyond it, however rich in facts. They have observed the sexual parts in plants, and employ themselves in collecting and arranging them conformably to the number of those parts, without inquiring any farther about them. When classed in their heads and herbals, into umbellated, rose-formed, or tubulous, with the number of their stamina ; if to this they are able to affix some Greek terms, they are possessed, they imagine, of the complete system of vegetation. Others of them go somewhat farther, and study the principles of plants ; to attain their object, they pound them in mortars, or dissolve them in alembics. The process being completed, they exhibit salts, oils, earths ; and gravely tell you, these are the principles of such and such a plant. For my part, I no more believe that any one can show me the principles

of a plant in a phial, than he can display those of a wolf, or a sheep, in a kettle. I respect the mysterious operations of chymistry; but when they act on vegetables, the process destroys them.

Many other errors have been adopted respecting the laws of expansion and fecundation of plants. The ancients distinguished, in many plants, males and females; and a fecundation, by means of emanations of the seminal powder, such as in the date-bearing palm-tree. We have applied this law to the whole vegetable kingdom. It embraces a very extensive field; but how many vegetables propagate themselves by suckers, slips, knittings, and the extremities of their branches! Here are, then, in the same kingdom, various methods of reproduction. Nevertheless, when we no longer perceive in Nature the law once adopted in our books of science, we weakly imagine she has gone astray. We have only one thread, and when it snaps, we conclude the system of the universe is on the point of dissolution. The Supreme Intelligence disappears the moment that our own happens to be disturbed. No doubt the AUTHOR of Nature has established laws for the vegetable world, now so generally studied, but still unknown.

There are laws of adaptation and utility in the generation of animals, to which we ascribe uncertainty, as soon as we perceive variety; or when we apprehend an approximation to the vegetable kingdom by imaginary relations, suggested by the perception of effects common to both.

Medicine has deduced a multitude of errors from those apparent analogies of the vegetable and animal kingdoms. Her studies are liable to strong suspicions. She pursues the operations of the soul through the structure of a corpse, and the functions of life in the lethargy of death. If she perceives some valuable property in a vegetable, she exalts it into a universal remedy. Listen to her aphorisms. Plants are useful to human life: hence she concludes a vegetable diet will make a man live for ages. Who can enumerate the books, treatises, panegyrics, composed on the virtues of plants! Many patients die, notwithstanding, with their stomachs full of those wonderful simples. Not that I undervalue their qualities when judiciously applied; but I absolutely reject the reasonings which attempt to connect the duration of human life with the use of a vegetable regimen.

The life of man is the result of all the moral adaptations, and depends more on sobriety, temperance, and the other virtues, than on the nature of aliments. The animals which live on plants, do they attain the age of man? The deer and wild goats, which feed on the admirable vulnerary herbs of Switzerland, ought never to die; but they are short-lived. The bees which suck the nectar of their flowers, likewise die, and several of their species in one year. A term is fixed for the life of every animal, and a regimen peculiar to it; that of man alone extends to every variety of aliment. The Tartar lives on raw horse-flesh, the Dutchman on fish, other nations on roots and milk diet; and in all countries you meet with old people. Vice alone, and mental uneasiness, shorten human life; and the moral affections possess such an influence over man, that even disease itself owes its origin to them.

The same extravagances existed in the systematic philosophy of the age of Socrates; not that he was unacquainted with Nature, for he had studied her thoroughly; but he relinquished the investigation of the causes, in the view of rising into admiration at the results. He collected many observations on the subject, and used them in his conversations on the Divine Providence.

✕ Nature presents nothing but harmonies and adaptations to our necessities, and we persist in vain efforts to trace her up to the causes she employs; as if we meant to extort from her the secrets of her power. (We do not know even the most common principles which she sets a working in our hands and feet. Earth, water, air, and fire, are elements, as we say; but under what form must earth appear to be an element? That stratum called *humus*, which covers it, and serves as a basis to the vegetable kingdom, is a refuse of all sorts of substances, of marl, sand, clay, and vegetables.)

Is sand its elementary part? Sand appears to be a secretion from the rock. Is the rock, then, an element? It appears to be an aggregation of sand, as in freestone. Whether of the two, sand or rock, was the principle of the other? and took the precedency to the formation of the globe? Supposing us possessed of this information, what have we gained? There are rocks formed of aggregations of all sorts. Granite is composed of grains; marbles and calcareous stones of the paste of shells and madrepores. There are banks of sand

composed of the wrecks of all these stones : I have seen the sand of crystal.

Shell-fish, which give us some light respecting the nature of calcareous stone, do not indicate the origin of that substance ; themselves forming the refuse that swims in the seas. Difficulties increase as you attempt to explain the formation of so many various bodies issuing out of the earth, and nourished by it. In vain you call to your assistance analogies, assimilations, homogeneities, and heterogeneities. Is it not strange, that thousands of species of resinous, oily, elastic, soft, and combustible vegetables, should differ so entirely from the rugged and stony soil which produces them ?

The Siamese philosophers easily get rid of all embarrassment on the subject, for they admit, in Nature, a fifth element, which is wood. But this supplement is incapable of carrying them very far ; for it is still more astonishing, that animal substance should be formed of vegetable, than that this last should be formed of fossil. Which way does it become sensible, living, and impassioned ? They admit, I grant, the interposition of the sun's action. But how can the sun be, in animals, the cause of any moral affection, when we do not see it exercising a disposing influence even on the component parts of plants ? For example, its general effect is to dry that which is humid. How comes it to pass then, that in a peach exposed to its action, the pulp externally should be meltingly plump, and the nut within extremely hard ; whereas the contrary takes place in the fruit of the cocoa-tree, replenished with milk inwardly, and clothed externally with a shell as hard as a stone ?

Neither has the sun more influence on the mechanical construction of animals ; whose interior parts, constantly moistened with humours, blood, and marrow, are frequently the hardest, such as the teeth and bones ; and the parts most exposed to his heat are often very soft, as hair, feathers, the flesh, and the eyes. How is there so little analogy between plants, tender, ligneous, liable to putrefaction, and the earth which produces them ; and between the corals and madrepores of stone, and the sea-water in which they are formed ? To all appearance, the contrary ought to happen : the water ought to have produced soft, the earth solid plants.

If things exist thus, there must be more than one good reason for it ; I think I have a glimpse of a tolerable one :

that if these analogies actually took place, the two elements would soon become uninhabitable, and be overwhelmed by their vegetation. The sea would be incapable of breaking madrepores of wood, and the air of dissolving forests of stone.

The same doubts might be started, respecting the nature of water. This element, we allege, is formed of small globules, which roll one over another; that to the spherical form of its elementary particles we ought to ascribe its fluidity. But if these are globules, there must be between them intervals and vacuities causing motion. How comes it to pass; then, that water is incompressible? If you apply to it a strong compressing power in a tube, it will force its way through the pores of that tube, though of gold; and burst it, if iron: no effort can reduce it to a smaller size. But, ignorant of the form of its component parts, we cannot even determine that of the combined whole. Does it consist in invisible vapours in the air, as the dew, or collected into mists in the clouds, or consolidated into masses in the ice, or finally, in a fluid state, as in the rivers? Fluidity, it is said, forms one of its principal characters. Yes, because we drink it in that state, and because, under this relation, it interests us the most. We determine its principal character, as we do that of all the objects of Nature, from our own craving necessity, but this character appears foreign to it: for it owes its fluidity to the action of heat; deprive it of this, and it changes into ice. It would be singular, should it be made to appear, after all our fundamental definitions, that the natural state of water was to be solid, and that of earth fluid: now this must actually be the case, if water owes its fluidity only to heat, and if earth is nothing but an aggregation of sands, united by different glues, and attracted to a common centre, by the general action of gravity.

The elementary qualities of air are not of more easy determination. Air, we say, is an elastic body: when shut up in the grains of gunpowder, the action of fire dilates it to such a degree, as to communicate to it the power of hurling a globe of iron to a prodigious distance. But how could it have been, with all this elasticity, compressed into the grains of a crumbling powder? If you put even any liquid substance into a state of fermentation in a flask, a thousand times more air will be separated from it, than you could force into the vessel without breaking it. How could this air be confined in a sub-

stance soft and fluid, without disengaging itself by its own action.

The air, when loaded with vapours, we farther say, is refrangible. The farther we advance north, the more elevated does the sun appear over the horizon, above the place which he actually occupies in the heavens. The Dutch mariners, who passed the winter of 1597 in Nova-Zembla, after a night of several months, saw the sun reappear fifteen days sooner than they expected. All this is very well; but if vapours render the air refrangible, why is there no aurora, nor twilight, nor any durable refraction of light whatever, between the tropics, not even on the sea, where so many vapours are exhaled, by the constant action of the sun, that the horizon is sometimes quite involved in mist by them?

The light is not refracted, says another philosopher, by the vapours, but by cold; for the refraction of the atmosphere is not so great at the end of summer as winter, at the autumnal equinox as at the vernal.

I admit the truth of this observation; however, after very hot days in summer, there is refraction to the north, as well as in our temperate climates, and none between the tropics: the cold, therefore, seems not to be the mechanical, but the final cause of refraction. This multiplication of light, which increases in the atmosphere, with the intenseness of the cold, is a consequence of the same law which transmits the moon into the northern signs, as the sun forsakes them, and causes her to illuminate the long nights of our pole, while the sun is under the horizon; for light of any sort is warm. These wonderful harmonies are not in the nature of the elements, but in the will of HIM who has established them in subordination to the necessities of a being endowed with sensibility.

Fire presents phenomena still more incomprehensible. First of all, is fire matter? Matter, according to philosophy, is divisible in length, breadth, and depth. Fire is divisible only in perpendicular length. Never will you divide a flame, or a ray of the sun, in its horizontal breadth. Here then is matter divisible only in two dimensions. Besides, it has no gravity, for it continually ascends; nor levity, for it descends, and penetrates bodies ever so much below it. Fire, we are told, is contained in all bodies. But, being of a consuming nature, how does it not devour them? How can it remain in water without being extinguished?

These and several other difficulties induced Newton to believe fire was not an element, but certain subtile matter put in motion. Friction, it is true, and collision, elicit fire from several bodies. But how comes it that air and water, though much agitated, never catch fire? Nay, how comes it that water even gets cold by motion, though its fluidity is entirely owing to its being impregnated by fire? Contrary to the nature of all other motions, wherefore does that of fire go on in a state of propagation, instead of meeting a check? All bodies lose their motion by communicating it. If you strike several billiard balls with one, the motion is communicated among them, it is divided and lost. But a spark of fire disengages from a piece of wood the igneous particles contained in it, and the whole together increase their rapidity to such a degree, as to make one vast conflagration of a whole forest.

We are not better acquainted with the negative qualities. Cold, they tell us, is produced by the absence of heat; but if cold is merely a negative quality, how is it capable of producing positive effects? If you put into water a bottle of iced wine, as I have seen done in Russia, you soon perceive ice of an inch thick cover the outside of the bottle. A block of ice diffuses cold all over the surrounding atmosphere. Darkness, which is a privation of light, diffuses no obscurity over surrounding light. If you open, in summer, a grotto dark and cool, the surrounding light will not be impaired by its darkness, but the heat of the adjacent air will be diminished by the cold issuing from it. I am aware of the reply: it will be said, if there is no perceptible obscuration in the first case, it is owing to the rapidity of light which replaces the darkness; but this would be increasing the difficulty, by supposing that darkness too has positive effects.

On such pretended fundamental principles are most of our systems of physics reared. If we are in error or ignorance at the outset, we soon go astray on the road; and it is incredible with what facility, having laid down our principles so slightly, we repay ourselves in consequences, vague terms, and contradictory ideas. I have seen, for example, the formation of thunder explained in celebrated physical tracts. Some say it is produced by the collision of two clouds; as if clouds or foggy vapours could produce a collision! Others gravely tell you it is the effect of air dilated by the sudden inflammation of the sulphur and nitre floating in it. But

that it may produce those tremendous explosions, we must suppose the air confined in a body which made some resistance. If a great mass of gunpowder is set fire to in an unconfined situation, no explosion follows. I know that the detonation of thunder has been imitated, in the experiment of fulminating powder; but the materials employed in its composition have a sort of tenacity. They undergo, from the iron ladle which contains them, a resistance against which they sometimes act with such violence as to perforate it. But to imitate a phenomenon is not to explain it. The other effects of thunder are explained with similar levity. As the air is cooler after a thunder-storm, the nitre, we are told, diffused through the atmosphere, is the cause of it; but was not that nitre there before the explosion, when we were almost suffocated with heat? Does nitre cool only when it is set on fire? On this principle our batteries of cannon ought to become glaciers in the midst of a battle, for a world of nitre is then kindled into flame; they must, however, cool the cannon with vinegar; for after having been fired off twenty times in quick succession, it is impossible to apply your hand to the piece. The instantaneous flame of the nitre penetrates the metal, notwithstanding its thickness and solidity.

The heat may likewise be occasioned by the interior vibration of the parts; but the cooling of the air after a thunder-storm proceeds, in my opinion, from the surrounding stratum of frozen air, from the height of 12 to 1500 fathoms, which being divided and dilated at its base by the fire of the stormy clouds, flows hastily into our atmosphere. Its motion determines the fire of the thunder to direct itself contrary to its nature, toward the earth.

It was affirmed, in the last age, that the earth was drawn out at the poles, and we are now positively told it is flattened there. I shall not at present enter into an examination of the principles of this last conclusion, and the observations on which it has been supported. The flattening of the earth at the poles has been accounted for from a centrifugal force, to which its motion through the heavens has been ascribed; though this pretended force, which has increased the diameter of the earth at the equator, has not the power of raising even a straw into the air.

The flattening of the poles, they tell us, has been ascer-

tained by the measurement of two terrestrial degrees, made at a vast expense; the one in Peru, near the equator, and the other in Lapland, bordering upon the polar circle.* Those experiments were made, undoubtedly, by men of great capacity and reputation. But persons of at least equal capacity and as high a name, have demonstrated, upon other principles and experiments, that the earth was lengthened at the poles. Cassini estimates at 50 leagues the length by which the axis of the earth exceeds its diameters, giving to each pole 25 leagues of elevation over the circumference of the globe. We shall agree with this illustrious astronomer, if we consider the testimony of the eye as of any weight; for the shade of the earth appears oval over its poles, in central eclipses of the moon, as was observed by Tycho Brahe and Kepler, whose names are a host in themselves.

× But without considering any name as an authority where natural truths are concerned, we may conclude, from simple analogies, the elongation of the axis of the earth. If we consider the two hemispheres as two mountains, whose bases are at the equator, the summits at the poles, and the ocean which alternately flows from one of these summits as a great river descending from a mountain, we shall have, under this point of view, objects of comparison to determine the point of elevation from which the ocean takes its rise, by the distance of the place where its course terminates. Thus the summit of Chimborazo, the most elevated of the Andes of Peru, out of which the river of the Amazons issues, having a league and one-third nearly of elevation above the mouth of that river, is distant from it, in a straight line, about 26 degrees, or 650 leagues; it may be thence concluded, that the summit of the pole must be elevated above the circumference of the earth nearly five leagues, to have a height proportioned to the course of the ocean, which extends as far as the line, 90 degrees distant, in a straight line.

If we farther consider, that the course of the ocean does not terminate at the line, but when it descends in summer from our pole, extends beyond the Cape of Good-Hope, as far as the eastern extremities of Asia, where it forms the westerly monsoon, which almost encompasses the globe under the equator, we must assign to the pole, from which it

* It is evident that the conclusion from those very measurements ought to have been, that the earth is lengthened at the poles.

departs, an elevation proportioned to its course, and of tripling, at least, that elevation, to give its waters a sufficient declivity. I put it down, then, at 15 leagues: and if to this height we add that of the ices there accumulated, the enormous pyramids of which over icy mountains have sometimes an elevation of one-third above the heights which support them, we shall find that the pole can hardly have less than an elevation of the 25 leagues above the circumference which Cassini assigned to it.

Obelisks of ice 10 leagues high are not disproportioned to the centre of cupolas of ice 2000 leagues in diameter, which, in winter, cover our northern hemisphere; and which have in the southern hemisphere, in February, that is, in the summer of that hemisphere, prominent borders, elevated like promontories, and 3000 leagues, at least, in circumference, according to the relation of Captain Cook, who coasted them round in 1773 and 1774.

○ The analogy I establish between the hemispheres of the earth, the poles, and the ocean which flows from them, and two mountains, their peaks, and the rivers which there have their sources, is in the order of the harmonies of the globe, which exhibits a great number of similar harmonies on a smaller scale in the continents, and in most islands, which are continents in miniature.

Philosophy has, in all ages, affected very obscure causes to explain common effects, in the view of attracting the admiration of the vulgar, who scarcely ever admire any thing but what they do not comprehend. She has taken advantage of this weakness of mankind, by infolding herself in a pomposity of words, or in the mysteries of geometry, the better to carry on the deception. For how many ages did she ring in our schools the horror of a *vacuum*, which she ascribed to Nature? How many pretended demonstrations of this have been given, which were to crown their authors with never-fading laurels, but are now gone to the land of forgetfulness?

× She disdains to dwell on simple observations, which level to every capacity the harmonies of all the kingdoms of Nature. For example, the philosophy of our day refuses to the moon all influence over vegetables and animals. The most considerable growth of plants, however, is in the night-time; nay, there are several vegetables which flower then only,

and numerous classes of insects, birds, quadrupeds, and fishes regulate their loves, hunting-matches, and peregrinations according to the phases of the orb of night. But what! degrade philosophers to the experience of gardeners and fishermen! What, condescend to think and talk like such groundlings!

< If philosophy denies the influence of the moon over the minuter objects of the earth, she makes it up amply, by giving her a very extensive power over the globe itself, without being over-scrupulous about the self-contradiction. She affirms that the moon, in passing over the ocean, presses upon it, and thus occasions the flux of the tides on its shores. But how is it possible the moon should compress our atmosphere, which only extends, they say, to a score of leagues at most from us? Or, admitting a subtile matter possessed of great elasticity, which should extend from our seas as far as the moon, how could this matter be compressed by it, unless you suppose it confined in a channel? Must it not extend to the right and left, while the action of the planet could not be felt on any determinate point of the circumference of our globe?

✕ Besides, why does not the moon act on lakes and seas of small extent, where there are no tides? Their smallness ought no more to exempt them from the influence of her gravitation, than deprive them of the benefit of her light. Why are tides almost imperceptible in the Mediterranean? Wherefore do they undergo, in many places, intermittent movements, and retardations of two or three days? Wherefore, in a word, toward the north, do they come from the north, east, or west, and not from the south, as was observed with surprise by Martens, Barents, Linschoten, and Ellis, who expected to see them come from the equator, as on the coasts of Europe?

The principal movements of the sea take place in our hemisphere at the same times with the principal phases of the moon; but we ought not from thence to conclude their necessary dependence, still less explain it by laws not demonstrated. The currents and tides of the ocean proceed, as I think I have proved, from the effusion of the polar ices, which depend on the variety of the course of the sun, as he approaches either pole: and as the phases of the moon are

themselves regulated by the course of the orb of day, this is the reason why both take place at the same time.

Farther, the full moon has an effective and evaporating warmth, which must act, therefore, on the polar ices.* The Academy of Sciences formerly maintained that her light did not warm, after experiments made on her rays, and on the ball of a thermometer, with a burning mirror. This error has been completely refuted at Rome and Paris by a simple experiment. A vessel full of water was exposed to the light of the moon, and another placed in the shade: the water in the first vessel was evaporated much sooner than in that of the second.

By all our industry and ingenuity, we can ascertain in Nature only results and harmonies: first principles universally escape us. The methods of our sciences have exercised a pernicious influence on our morals and religion. Men are easily misled respecting an intelligence which governs all things, when nothing is presented to them as first causes but mechanical means. Alas! that is not the way toward that heaven we pretend to know so well. The greatest of mankind have looked thitherward as their last asylum. Cicero hoped after death to inhabit the stars; and Cæsar, from that elevation, to preside over the destiny of Rome.

How! as the reward of virtue is our destination only to be confounded with the elements! What, thy soul, O sublime Fenelon! to be exhaled in inflammable air, and to have had on earth the sentiment of an order which did not exist even in the heavens! How, among those stars so luminous is there nothing but material globes; and in their motions, so constant and varied, nothing but blind attractions? How! every thing around us insensible matter and no more; and intelligence given to man only to render him miserable! How! and can we have been deceived by the involuntary sentiment which makes us raise our eyes to heaven in the agony of sorrow, there to solicit relief!

Ah! not thus has Nature appointed her gifts. We bewilder ourselves with vain sciences. By driving our researches up to the very principles of Nature, nay, of DEITY, we have stifled, in the heart, all feelings of both. We are like the peas-

* This observation was made more than 1600 years ago. 'The moon produces thaw; dissolving all ices and frosts by the humidity of her influence.'—Pliny's Natural History, book ii. chap. 101.

ant who was living happily in a little valley in the heart of the Alps. A brook descending from those mountains fertilized his garden. Long he adored in tranquillity the beneficent Naiad who supplied his stream, and increased its quantity and coolness with the summer's heat. One day he was desirous to discover the place where she concealed her inexhaustible urn. To prevent his going astray, he pursues upward the track of his rivulet. Every step discovers to him a thousand new objects; plains, forests, rivers, kingdoms, boundless oceans. Transported with delight he proceeds in flattering hope of speedily reaching the blessed abode where the gods preside over the destiny of this world. But, after a painful scramble, he arrives at the bottom of a tremendous glacier. He no longer sees anything around him but mists, rocks, torrents, precipices. All, all has vanished. Sweet and tranquil valley, humble roof, beneficent Naiad! his patrimony is now reduced to a cloud, and his divinity to an enormous mass of ice.

✕ But the sublime genius and the pure spirit of Newton assuredly could not have stood still at the boundary prescribed to a vulgar mind. Had he been in the place of our Alpine peasant, he would have observed, with admiration, the constant impulsion communicated by the action of the sun, placed at an immense distance; and instead of fruitlessly rambling after the habitation of a Naiad, at the summit of the Alps, would have prostrated himself before that God, whose providence embraces the concerns of a universe.

✕ In order to study Nature with understanding and to advantage, all the parts must be viewed in their harmony and connexion. The system of its harmonies I shall now proceed to unfold, is, in my opinion, the only one within the reach of man. It was first displayed by Pythagoras of Samos, the father of philosophy, and founder of that sect transmitted to us under the name of Pythagoreans. Never did a succession of men arise so enlightened as those sages were in the natural sciences, and none whose discoveries reflect higher honour on the human understanding. There existed, at that time, philosophers who maintained that water, fire, air, atoms, were the principles of things. Pythagoras opposed to this doctrine that the principles of things were the adaptations and proportions of which the harmonies were composed, and that goodness and intelligence constituted the nature of God.

STUDY TENTH.

OF SOME GENERAL LAWS OF NATURE; AND FIRST, OF
PHYSICAL LAWS.

WE shall divide these laws into *physical* and *moral*, and endeavour to unfold the means of diminishing the sum of human wretchedness. I am presuming to open a path hitherto unattempted, and dare not flatter myself that my progress and success keep pace with the ardour of my imagination and the anticipations of my heart. But the imperfect materials I have collected may perhaps one day assist men of greater ability in raising to Nature a temple more worthy of her.

OF CONFORMITY.

Though conformity be a perception of our reason, I place it at the head of our physical laws, because it is the first feeling we endeavour to gratify in examining natural objects. Nay, there is a connexion so intimate between the physical character of those objects and the instinct of every being possessed of sensibility, that a colour simply is sufficient to rouse the passions of animals. A red object puts the bullock into a rage, and suggests to most fowls and fishes the idea of prey. The objects of Nature display in man a feeling of a higher order, independent of his wants; it is that of conformity. It is by means of the multiplied conformities of Nature that man has formed his own reason; for *reason* means nothing else but the *relation* or *conformity* of things that exist.

✱ Animals have a sensibility only of objects having conformities to their wants; and they have, in this respect, a share of reason as perfect as our own. But man differs from animals in his capacity of extending this sentiment of conformity to all the relations of Nature, however foreign to his personal demands; and this extension of reason has procured him, by way of eminence, the denomination of a rational animal.

It is true, that if all the particular rationality of animals were united, the sum would probably transcend the general reason of man; for human reason has devised most of its

arts and crafts from an imitation of their productions: besides, all animals come into the world with their peculiar industry, whereas man must acquire his by time and reflection, and by imitating the industry and skill of another. (But man excels them, not only by uniting in himself the intelligence of all, but by his capability of rising upward to the source of all conformities, to God himself.)

The only character which essentially distinguishes man from the animal is, he is a religious being. They partake not with him of this sublime faculty, the principle of human intelligence. By it man is exalted above the beasts, enabled to form a conception of the general plans of Nature, and supposes an order of things from having caught a glimpse of an Author. It was not Nature which first pointed out God to man, but a sense of the DEITY in man which indicated to him the order of Nature. The savages are religious long before they are naturalists.]

Accordingly, by the sentiment of this universal conformity man is struck with all possible conformities, though foreign to him. He takes an interest in the history of an insect; and if his attention is not engaged in behalf of all the insects which surround him, it is because he perceives not their relations, or else the constant habit of seeing them renders them insipid; perhaps it may be some contemptible prejudice, for he is affected still more by moral than physical ideas, and by his passions more than by his reason.

We shall farther remark, that all the sentiments of conformity spring up in the heart of man at the sight of some useful end, which frequently has no relation to his own personal wants; [it follows that man is naturally good, because he is rational; seeing the aspect alone of a conformity, though foreign to him, communicates pleasure. From this natural sentiment of goodness the sight of well-proportioned animals conveys to us agreeable sensations, increasing in proportion as the creature unfolds its instinct. Want of conformity also communicates a painful sensation, always excited at the sight of any thing incongruous. We are shocked on looking at a monster, pained to see an animal wanting a foot or an eye, nay, at the sight of incongruity even in insensible objects. Withered plants, mutilated trees, an ill-assorted edifice, hurt our feelings. These sensations are perverted or suppressed in man only by prejudice or by education.

OF ORDER.

A series of conformities, with a common centre, constitutes order. There are conformities in the members of an animal, but order exists only in the body. Conformity refers to the detail, order to the combination. Order extends our pleasure, by collecting conformities, and fixes them by a determination towards one centre. It discovers at once, in a single object, a succession of particular conformities, and the leading one to which they all refer.

Thus, as being endowed with a reason which embraces all Nature, it affords us pleasure to review the relations between the proboscis of a bee and the nectareous juices of flowers; between those of her thighs, hollowed into spoons, and bristled with hairs, to the fine powder of the stamina which she there collects; the use of a long sting, furnished for the defence of her property, and all the conformities of the organs of this small insect, are more ingenious and in much greater number than those of the largest animals.

The interest, however, grows upon us when we see her covered with a yellow powder, her thighs pendent and half oppressed with her burden, directing her flight across plains, rivers, and shady groves, under points of the wind, with which she is well acquainted, and alighting with a humming sound, on the cavernous trunk of some aged oak; that one, whose particular conformities we have been admiring, is only a single member of a numerous republic; this republic itself is but a small colony of the immense nation of bees spread over the whole earth, from the line to the shores of the frozen ocean. This nation again is subdivided into species, conformably to the variety of flowers; for some being destined to live on flowers which have no depth, such as the radiated, are armed with five hooks, to prevent their sliding on the petals. Others, such as the bees of America, have no stings, because they construct their hives in the trunks of prickly trees, very common there, which accordingly afford them protection. Many are the conformities among other species of bees, totally unknown to us; yet this vast nation is but one little family of the class of flies, of which we know, in our climate alone, near 6000 species, as distinct, as to forms and instincts, as bees themselves are from other flies.

Were we to compare the relations of this volatile class, so

numerous in itself, with all the parts of the vegetable and animal kingdoms, we should find an innumerable multitude of different orders of conformity, endless classes, with their divisions and subdivisions, [the minutest individual of which presents a very extensive sphere of conformities, are themselves only particular conformities, only rays and points in the general sphere, of which man alone occupies the centre, and apprehends the immensity.]

From a sense of the general order two sentiments obviously result ; the one throws us imperceptibly into the bosom of the DEITY, and the other recalls us to the perception of our wants ; the one exhibits to us, as the original cause, a Being infinitely intelligent without us ; the other, as the ultimate end, a very limited being in our own person. These sentiments characterize the spiritual and corporeal powers of man, and are the general sources of the pleasure we derive from the order of Nature.

A bee has a sentiment of the order of her hive, yet knows not how the ants regulate their nest, though she may have seen them labour. To no purpose would she resort, in the event of her hive's being destroyed, to seek refuge, as a republican, in the midst of their republic ; she would meet from them no hospitality, no consideration, no compassion. Hence it follows, that the society of animals could not subsist independent of the passions, nor human society independent of virtue. Man alone, of all animals, possesses the sentiment of universal order, that of DEITY himself ; and by carrying over the whole earth the virtues which are the fruits of it, whatever may be the differences which prejudice interposes between man and man, it is sure of alluring all hearts to itself.

OF HARMONY.

Nature opposes beings to each other, in order to produce between them agreeable conformities. This law has been acknowledged from the highest antiquity. It is to be found in many passages of the holy Scriptures. I produce one from the book of Ecclesiasticus :* ‘All things are double one against another ; and He hath made nothing unperfect : one thing establisheth the good of another.’

I consider this great truth as the key of all philosophy. It has been fruitful in discovery, as well as that other :

* Chap. xiii. ver. 24, 25.

Nothing has been created in vain. It has been the source of taste in arts and eloquence. Out of contraries arise the pleasures of vision, hearing, touching, tasting, and all the various attractions of beauty. But from contraries likewise arise ugliness, discord, and all disgusting sensations. Is it wonderful that Nature should employ the same causes to produce opposite effects? When she opposes contraries to each other, painful affections are excited in us; but when she blends them, we are agreeably affected. From the opposition of contraries springs discord, from their union results harmony.

Let us find in Nature some proofs of this law. Cold is the opposite of heat, light of darkness, earth of water; and the harmony of these contrary elements produces effects the most delightful; but if cold succeeds rapidly to heat, or heat to cold, most vegetables and animals are in danger of perishing. The light of the sun is agreeable; but if a black cloud suddenly intercepts the lustre of his rays, or if lightning bursts from the bosom of a dark night, the eye undergoes a painful sensation.

Nature opposes, at sea, the white foam of the billows to the black colour of the rocks, to announce to mariners from afar the danger of shallows. She frequently presents to them forms analogous to destruction, such as those of ferocious animals, edifices in ruins, or the keels of ships turned upward. She even extracts from these awful forms hollow noises resembling groans, and broken off by long intervals of silence. She employs also those clashing oppositions and ominous signs to express the characters of savage and dangerous animals. The lion strolling through the solitudes of Africa announces his approach by roarings resembling thunder. The vivid and instantaneous flashes of fire, which dart from his eyes in the dark, exhibit besides the appearance of lightning. During the winter season the howlings of wolves in the forests of the north resemble the whistling of the winds among trees; the cries of birds of prey are shrill, piercing, and now and then interrupted by hollow notes. Nay, some emit the sounds of a human being in pain. Such is the lom, a species of sea-fowl, which feeds on the shelvy coasts of Lapland,* on the dead bodies of animals thrown ashore: he cries like a man drowning.

* See John Schæffer's History of Lapland.

Noxious insects exhibit the same oppositions and signals of destruction. The gnat, thirsting after human blood, announces himself to the eye by the white points on his brown-coloured body, and to the ear by his shrill notes, which disturb the tranquillity of the grove; the carnivorous wasp is speckled with black stripes on a yellow ground; and the insects which attack our persons more immediately, are distinguished by glaring oppositions of colour to the field on which they settle.

But when two contraries come to be blended, the combination produces pleasure, beauty, and harmony. I call the instant and the point of their union *harmonic expression*. This is the only principle I have perceived in Nature, for the elements themselves, as we have seen, are not simple; they always present accords formed of two contraries to analyses multiplied without end. Thus the gentlest temperature, and the most favourable to every species of vegetation, are those of the seasons in which the cold is blended with heat, as spring and autumn. They are then productive of two saps in trees, which the strongest heats of summer do not effect. The most agreeable production of light and darkness is perceptible at those seasons when they melt into each other, and form what painters call the *clear-obscure* and *half-lights*. Hence the most interesting hours of the day are those of morning and evening; when the shade and light strive for the mastery of the azure fields. The most lovely prospects are those in which land and water are lost in each other; this suggested that observation of honest Plutarch, namely, that the pleasantest land-journeys are those along the shore of the sea; and the most delightful voyages those which are coasting along the land. You will observe these same harmonies result from savours and sounds the most opposite, in the pleasures of the palate and of the ear.

We shall proceed to examine the uniformity of this law, in the very principles by which Nature gives us the first sensations of her works, viz. colours, forms, and motions.

OF COLOURS.

Colours, say naturalists, are refractions of light on bodies, demonstrated by the prism, which, by breaking a ray of the sun, decomposes it into seven coloured rays, displaying themselves in the following order: red, orange, yellow,

green, blue, indigo, and violet. These are, as they will have it, the seven primitive colours ; but as we do not know what is primitive in Nature, I shall content myself with a few reflections on the number and order of those seven pretended primitive colours.

First, it is evident four of these are compounded ; for orange is made up of yellow and red ; green of yellow and blue ; violet of blue and red ; and indigo is only a tint of blue surcharged with black. This reduces the solar colours to three primordial ; namely, yellow, red, and blue ; to which if we add white, the colour of light, and black, the privation of it, we shall have five simple colours, with which may be compounded all imaginable shades of colour.

× I must here observe, that our philosophical machinery deceives us with its affectation of superior intelligence, not only in ascribing false elements to Nature, as when the prism displays compound for primitive colours, but by stripping her of such as are true ; for how many white and black bodies must be reckoned colourless, considering that this same prism does not exhibit their tints in the decomposition of the solar ray !

This instrument leads us farther into an error respecting the natural order of these very colours, by making the red ray the first in the series, and the violet ray the last. The order of colours in the prism, therefore, is only a triangular decomposition of a ray of cylindrical light, the two extremes of which, red and violet, participate the one of the other, without terminating it ; so that the principle of colours, which is the white ray and its progressive decomposition, is no longer manifested in it. I believe it is even possible to cut a crystal with so many angles as would give to the refractions of the solar ray an order entirely different, and multiply the pretended primitive colours far beyond the number seven. The authority of such a polyedron would be as respectable as that of the prism, if the algebraists were to apply to it a few calculations, somewhat obscure, with a seasoning of the corpuscular philosophy, as they have done with regard to the effects of the triangular instrument.

We shall employ a method, not quite so learned, to convey an idea of the generation of colours, and the decomposition of the solar ray. Instead of examining them in a prism of glass, we shall consider them in the heavens, and there we

shall behold the five primordial colours unfold themselves in the order which we have indicated.

In a fine summer's night, when the sky is loaded only with some light vapours, sufficient to stop and to refract the rays of the sun, walk out into an open plain, where the first fires of Aurora may be perceptible. You will first observe the horizon whiten at the spot where she is to make her appearance ; and this radiance, from its colour, has procured for it, in the French language, the name of *aube*, (the dawn,) from the Latin word *alba*, white. This whiteness insensibly ascends in the heavens, assuming a tint of yellow some degrees above the horizon ; the yellow as it rises passes into orange ; and this shade of orange rises upward into the lively vermilion, which extends as far as the zenith. From that point you will perceive in the heavens behind you the violet succeeding the vermilion, then the azure, after it the deep blue or indigo colour, and, last of all, the black, quite to the westward.

Though this display of colours presents a multitude of intermediate shades, which rapidly succeed each other, yet at the moment the sun is going to exhibit his disk, the dazzling white is visible in the horizon, the pure yellow at an elevation of 45 degrees ; the fire colour in the zenith ; the pure blue 45 degrees under it, toward the west ; and in the very west the dark veil of night still lingering on the horizon. I think I have remarked this progression between the tropics, where there is scarcely any horizontal refraction to make the light prematurely encroach on the darkness, as in our climates.

Sometimes the trade-winds, from the north-east or south-east, blow there, card the clouds through each other, then sweep them to the west, crossing and recrossing them over one another, like the osiers interwoven in a transparent basket. They throw over the sides of this chequered work the clouds which are not employed in the contexture, roll them up into enormous masses, as white as snow, draw them out along their extremities in the form of a crupper, and pile them upon each other, moulding them into the shape of mountains, caverns, and rocks ; afterwards, as evening approaches, they grow somewhat calm, as if afraid of deranging their own workmanship. When the sun sets behind this magnificent netting, a multitude of luminous rays are transmitted

through the interstices, which produce such an effect, that the two sides of the lozenge illuminated by them have the appearance of being girt with gold, and the other two in the shade seem tinged with ruddy orange. Four or five divergent streams of light, emanated from the setting sun up to the zenith, clothe with fringes of gold the undeterminate summits of this celestial barrier, and strike with the reflexes of their fires the pyramids of the collateral aerial mountains, which then appear to consist of silver and vermilion. At this moment of the evening are perceptible, amidst their redoubled ridges, a multitude of valleys extending into infinity, and distinguishing themselves at their opening by some shade of flesh or of rose colour.

These celestial valleys present in their different contours inimitable tints of white, melting away into white, or shades lengthening themselves out without mixing over other shades. You see, here and there, issuing from the cavernous sides of those mountains, tides of light precipitating themselves, in ingots of gold and silver, over rocks of coral. Here it is a gloomy rock, pierced through and through, disclosing, beyond the aperture, the pure azure of the firmament; there it is an extensive strand, covered with sands of gold, stretching over the rich ground of heaven; poppy-coloured, scarlet, and green as the emerald.

The reverberation of those western colours diffuses itself over the sea, whose azure billows it glazes with saffron and purple. The mariners, leaning over the gunwale of the ship, admire in silence those aerial landscapes. Sometimes this sublime spectacle presents itself to them at the hour of prayer, and seems to invite them to lift up their hearts with their voices to the heavens. It changes every instant into forms as variable as the shades, presenting celestial colours and forms which no pencil can pretend to imitate, and no language can describe.]

Travellers who have, at various seasons, ascended to the summits of the highest mountains on the globe, never could perceive, in the clouds below them, any thing but a gray and lead-coloured surface, similar to that of a lake. The sun, notwithstanding, illuminated them with his whole light; and his rays might there combine all the laws of refraction to which our systems of physics have subjected them. Hence not a single shade of colour is employed in vain,

through the universe ; those celestial decorations being made for the level of the earth, their magnificent point of view taken from the habitation of man.

These admirable concerts of lights and forms, manifest only in the lower region of the clouds the least illuminated by the sun, are produced by laws with which I am totally unacquainted. But the whole are reducible to five colours : yellow, a generation from white ; red, a deeper shade of yellow ; blue, a strong tint of red ; and black, the extreme tint of blue. This progression cannot be doubted, on observing in the morning the expansion of the light in the heavens. You there see those five colours, with their intermediate shades, generating each other nearly in this order : white, sulphur yellow, lemon yellow, yolk of egg yellow, orange, aurora colour, poppy red, full red, carmine red, purple, violet, azure, indigo, and black. Each colour seems to be only a strong tint of that which precedes it, and a faint tint of that which follows ; thus the whole together appear to be only modulations of a progression, of which white is the first term, and black the last.

Indeed trade cannot be carried on to any advantage, with the Negroes, Tartars, Americans, and East Indians, but through the medium of red cloths. The testimonies of travellers are unanimous respecting the preference universally given to this colour. I have indicated the universality of this taste, merely to demonstrate the falsehood of the philosophic axiom, that tastes are arbitrary, or that there are in Nature no laws for beauty, and that our tastes are the effects of prejudice. The direct contrary of this is the truth ; prejudice corrupts our natural tastes, otherwise the same over the whole earth.

With red Nature heightens the brilliant parts of the most beautiful flowers. She has given a complete clothing of it to the rose, the queen of the garden : and bestowed this tint on the blood, the principle of life in animals : she invests most of the feathered race, in India, with a plumage of this colour, especially in the season of love ; and there are few birds without some shades, at least, of this rich hue. Some preserve entirely the gray or brown ground of their plumage, but glazed over with red, as if they had been rolled in carmine ; others are besprinkled with red, as if you had blown a scarlet powder over them.

The red colour, situated in the midst of the five primordial

colours, is the harmonic expression of them by way of excellence ; and the result of the union of two contraries, light and darkness. There are, besides agreeable tints, compounded of the oppositions of extremes. For example, of the second and fourth colour, that is, of yellow and blue, is formed green, which constitutes a very beautiful harmony, and ought, perhaps, to possess the second rank in beauty, among colours, as it possesses the second in their generation. Nay, green appears to many, if not the most beautiful tint, at least the most lovely, because it is less dazzling than red, and more congenial to the eye.

✕ Colours may also have a powerful influence on the passions ; and, as well as their harmonies, may be referred to the moral affections. For example, making red the point of departure, which is the harmonic colour supereminently, and proceeding towards white in an ascending progression, the nearer you approach to this first term, the more lively and gay are the colours. You will have in succession the poppy, orange, yellow, lemon, sulphur, and white. On the contrary, the farther you proceed from red towards black, the sadder and more lugubrious are the colours ; for this is the progression ; purple, violet, blue, indigo, and black.

In the harmonies to be formed, on both sides, by the union of opposite colours, the more that the tints of the ascending progression predominate, the more lively will be the harmonies produced ; and the contrary will take place as the colours of the descending harmony shall prevail. From this harmonic effect, green, compounded of yellow and blue, is so much more gay, as the yellow has the ascendant, and sad in proportion as the blue predominates.

From this harmonic influence, white transfuses most gayety into all other tints, because it is light itself. Nay, it produces, from opposition, a most delightful effect in the harmonies, which I call melancholy ; for blended with violet, it gives the delicious hue of the lilac flower ; mixed with blue, it makes azure ; and with black, produces pearl-gray ; but melted away into red, it exhibits the rose-colour, that enchanting tint, the flower of life. But according to the predominance of black in gay colours, the effect produced is more mournful than that of unmixed black. This becomes perceptible on blending it with yellow, orange, and red, thereby rendered dull and gloomy colours. Red gives life

wherever it is infused, as white communicates gayety, and black sadness.

It would be ridiculous to affect ignorance of the objections which may be started against the universality of these principles. We have represented white as a gay, and black as a sad colour. Nevertheless, certain negro nations represent the devil as white; the inhabitants of the peninsula of India, in token of mourning, rub their forehead and temples with the powder of sandal-wood, the colour of which is a yellowish white. The navigator La Barbinois says, that white is the colour of mourning among the Chinese. From these instances it might be concluded, that the feeling of colour must be arbitrary, as it is not the same in all nations.

I venture to offer the following reply to these objections. The black nations of Africa and Asia prefer white women to those of every other tint. If there be negro nations who paint the devil white, it is from the strong feeling they have of the tyranny the whites exercise over them. White, accordingly, having become with them a political colour, ceases to be a natural one. Besides, the white of the devil is not a white beautifully harmonious, like that of the human figure, but a dead chalk white, such as that with which our painters illuminate the figures of phantoms and ghosts in their magical and infernal scenes.

If this dazzling colour is the expression of mourning among the Indians and Chinese, the reason is, it contrasts harshly with the black skin of those nations. The Indians are black. The skin of the southern Chinese is much sunburnt. They derive their religion and leading customs from India, the inhabitants of which are black. Their outward garments are of a gloomy colour; and the ornamental furniture of their houses consists of beautiful black varnished ware. White must, therefore, produce a harsh dissonance with their furniture, dress, and above all, with the dusky colour of their skin.

If those nations wore a black habit, in mourning, as we do, be their colour ever so deep, it would not form a clashing opposition in their dress. The expression of grief, accordingly, is precisely the same with them as with us. For if we in mourning oppose the black colour of our clothes to the white of our skin, thence to produce a funereal dissonance, the southern nations oppose the white colour of their gar-

ments to the dusky colour of their skin, to produce the same effect.

This variety of taste confirms the universality of the principles we have laid down respecting the causes of harmony and dissonance. It farther demonstrates, that the agreeableness or disagreeableness of a colour resides not in one single shade, but in the harmony, or in the clashing contrast, of two opposite colours.

OF FORMS.

If I am not mistaken, the principles of these, as of colours, are reducible to five, the line, triangle, circle, ellipse, and parabola.

The line generates all forms, as the ray of light does all colours. It goes on like the other, in its generations, step by step, producing first, by three fractions, the triangle, which of all others contains the smallest surfaces under the greatest of circuits. The triangle afterward, composed itself of three triangles at the centre, produces the square, which consists of four triangles from the central point; the pentagon, which consists of five; the hexagon, which consists of six; and so of the rest of the polygons, up to the circle, composed of a multitude of triangles, whose summits are at its centre, and the bases at its circumference: and which, contrary to the triangle, contains the greatest of surfaces under the smallest of peripheries. The form which has, hitherto, always been going on progressively, commencing with the line, relatively to a centre, up to the circle, afterwards deviates from it, and produces the ellipse, then the parabola, and finally all the other widened curves, the equations of which may all be referred to this last. So that, under this aspect, the indefinite line has no common centre: the triangle has three points in its bounding lines, which have a common centre; the square has four; the pentagon five; the hexagon six; and the circle has all the points of its circumference regulated conformably to one common and only centre. The ellipse begins to deviate from this regulation, and has two centres; and the parabola, as well as the other curves, which are analogous to it, have centres innumerable contained in their several axes, from which they remove farther and farther, forming something like funnels.

On the supposition of this ascending generation of forms,

from the line, through the triangle, up to the circle ; and their descending generation, from the circle, through the ellipse, to the parabola, I deduce, from these five elementary forms, all the forms of Nature ; as, with five primordial colours, I compose all the possible shades of colour.

The line presents the slenderest form, the circle the fullest, and the parabola the most obliquely fluted. In this progression, the circle, which occupies the middle between these two extremes, is the most beautiful of all elementary forms, as red is the most beautiful primordial colour. I presume not to say, that this form must be the most beautiful, because it is the figure of the stars, which, however, would be no contemptible reason ; but, to employ only the testimony of our senses, it is the most grateful to both eye and touch ; and the most susceptible of motion ; finally, it is considered as most conformable to the taste of all nations, who employ it in their ornaments and architecture ; and it is particularly conformable to the taste of children, who prefer it to every other, in the instruments of their amusement.

It is remarkable, that these five elementary forms have the same analogies to each other which the five primordial colours have among themselves ; so that if you proceed to their ascending generation, from the sphere toward the line, you will have forms angular, lively, and gay, which shall terminate in the straight line. If, on the contrary, you descend from the sphere to the excavations of the parabola, you will be presented with a gradation of cavernous forms, so frightful in abysses and precipices.

Farther, if you join the elementary forms to the primordial colours, term for term, you will observe their principal character mutually strengthen each other, at least in the two extremes, and in the harmonic expression of the centre : for the first two terms will give the white ray, that of light itself ; the circular form, united to the red colour, will produce a figure analogous to the rose, composed of spherical portions, with carmine tints, and, from the effect of this double harmony, deemed the most beautiful of flowers. Finally, black, added to the vacuity of the parabola, increases the gloom of retreating and cavernous forms.

With these five elementary forms may be composed figures as agreeable as the shades produced from the harmonies of the five primordial colours. So that the more there shall

enter, into those mixed figures, of the two ascending terms of the progression, the more light and gay such figures will be ; and the more the two descending terms shall predominate, the more heavy and dull will be the forms. Thus, the form will be more elegant, as the first term, the straight line, shall have the predominance. For example, the column gives us pleasure, because it is a long cylinder, with the circle for its basis, and two straight lines, or a long quadrilateral figure, for its elevation. But the palm-tree, of which it is an imitation, pleases still more, because the stellated and radiating forms of its palms, likewise taken from the straight line, constitute a very agreeable opposition with the roundness of its stem ; and if to this you unite the harmonic form by way of excellence, namely, the circular, you will add inexpressibly to the grace of this beautiful tree. This, likewise, Nature, who knows much more of the matter than we, has taken care to do, by suspending, at the basis of its divergent boughs, sometimes the oval date, and sometimes the rounded cocoa-nut.

In general, as often as you employ the circular form, you will greatly enhance the agreeableness of it, by uniting it with the two contraries of which it is composed ; for you will then have a complete elementary progression. The circular form alone presents but one expression, the most beautiful of all, in truth ; but united to its two extremes, it forms, if I may so express myself, an entire thought.

× It is, farther, from these harmonies, that long ridges of mountains, overtopped by lofty peaks of a pyramidical form, separated by deep valleys, delight us by their gracefulness and majesty. If to these you add rivers meandering below, radiating poplars waving on their banks, flocks of cattle and shepherds, you will have vales similar to that of Tempe. The circular forms of the mountains, in such a landscape, are placed between their extremes, namely, the prominency of the rocks, and the cavity of the valleys. But if you separate from it the harmonic expressions, that is, the circular wavings of those mountains, together with their peaceful inhabitants, and allow the extremes only to remain, you will then have the dreary prospect of Cape Horn ; angular, perpendicular rocks, hanging over fathomless abysses.

If to these you add oppositions of colour, as that of snow on the summits of the dusky rocks, the foam of the billows

breaking on the lurid shore, a pale sun in a gloomy sky, torrents of rain in the midst of summer, tremendous squalls of wind succeeded by sullen calms, a European vessel, on her way to spread desolation over the islands of the South Sea,* running upon a rock when it is beginning to grow dark, firing from time to time guns, the signal of distress, the noise of which the echoes of those horrid deserts reverberate, the terrified Patagonian running in amazement to his cave; and you will have a complete view of that land of desolation, covered over with the shades of death.

OF MOVEMENTS.

It remains that I suggest a few reflections on the subject of motions. Of these we shall also distinguish five which are fundamental: self-motion, or the rotation of a body round itself, which supposes no change of place, and is the principle of all motion; such is, perhaps, that of the sun; after that, the perpendicular, circular, horizontal, and state of rest. All movements may be referred to these five. Nay, geometers, who represent them likewise by figures, suppose the circular motion to be generated of the perpendicular and horizontal, and, to use their language, produced by the diagonal of their squares.

I shall not insist on the analogies which actually exist between the white colour,* the straight line, and self-motion, or rotation; the red colour, the spherical form, and circular motion; between darkness, vacuity, and rest. I leave to the reader the pleasure of following up this idea, and forming to himself, with these elements of Nature, harmonies the most enchanting, with the additional charm of novelty. I shall confine myself, at present, to a few hasty observations respecting motion.

Of all movements, the harmonic or circular motion is the most agreeable. Nature has diffused it over most of her works, and rendered even the vegetables in the earth susceptible of it. Our plains represent this, when the winds form,

* Would not the effect of this dreadful picture have been considerably strengthened, had our Author represented his European vessel as attempting to double Cape Horn, *on her return* from spreading devastation over the South Seas, and making shipwreck on that coast, *after* the scene of blood was acted? In this case we should have had the striking and instructive representation of the connexion between Human Guilt and Divine Justice; of the clashing collision of criminality and vengeance.—H. H.

on the meadow or corn-field, a series of undulations, resembling the waves of the sea ; or when they gently agitate, on the sides of the lofty mountains, the towering tops of the trees, waving them about in segments of a circle. >Most birds form portions of great circles as they play through the airy expanse, and seem to take pleasure in tracing, as they fly, curves and spiral motions. Nature has bestowed this agreeable style of flying on many species of the feathered race, not otherwise to be prized for their song or plumage. Such is the flight of the swallow.

The case differs with respect to the movements of ferocious or noxious animals. They advance leaping, springing, and join to slow movements others violently rapid ; as in the motion of the cat watching a mouse : those of the tiger are exactly similar. The same discordancy is observable in the flight of carnivorous birds. The species of owl called the grand-duke floats through a tranquil sky, as if the wind carried him this way and that. Tempests present, in the heavens, the same characters of destruction. You sometimes perceive stormy clouds moving in opposite directions ; now they fly like lightning, while others remain immoveable as the rock. In the tremendous hurricanes of the West Indies, the explosion is always preceded and followed by a dead calm.

The more a body possesses of self-motion, or rotation, the more agreeable it appears, especially when united to the harmonic or circular motion. X From the effect of self-motion, every moral idea out of the question, animals interest us more than vegetables, because they have the principle of motion within themselves.

Motion is the expression of life. In this you see why Nature has multiplied the causes of it in all her works. One of the great charms of a landscape is objects in motion ; but this the pictures of most of our great masters frequently fail to express. If you except those representing tempests, everywhere else their forests and meadows are motionless, and the water of their lakes congealed. [Yet the inversion of the leaves of trees presenting a gray or white underside ; the undulations of the grass in valleys, and on the ridges of mountains ; those which ruffle the surface of the waters, and the foam which whitens the shores, recall, with inexpressible pleasure, in a burning summer scene, the breath so gentle and cooling of the zephyrs.] To these might be added, with

infinite grace and powerful effect, the movements peculiar to the animals which inhabit them ; it might be possible even to represent the motion and weight of a loaded carriage toiling up a hill, by expressing the dust of the crushed pebbles rising up behind its wheels. Nay, I think the effects of the singing of birds, and of the echoes, might be rendered perceptible, by the expression of certain characters not necessary here to unfold.

So far are our painters, those even whose talents are conspicuous, from paying attention to accessories so agreeable, that they omit them in subjects of which those accessories form the principal character. For example, if they represent a chariot at full speed, they exhibit every spoke of the wheels. The horses, indeed, are galloping, but the chariot is immovable. The wheels of a carriage, however, running with a rapid motion, present but one single surface ; all their spokes are confounded to the eye. I have seen, in modern pictures, machines in motion, wrestlers and warriors in action, but in no one of them did I ever find attention paid to these effects so simple, yet so expressive of the truth of Nature. Our painters consider them as petty details, beneath the notice of a man of genius. Nevertheless they are traits of character.

Details, frequently traits of character, are not to be despised. If our painters and sculptors withhold the expression of motion to landscapés, wrestlers, and chariots in the course, they bestow it on the portraits and statues of our great men. They represent them as angels sounding the alarm to judgment, with flowing hair, wild wandering eyes, the muscles of the face convulsed, and garments fluttering in the wind. These, they tell us, are the expressions of genius. But persons of genius, and great men, are not bedlamites. I have seen some of their portraits, on antiques, which represent them with a serene and tranquil air. (It is the property of inanimate matter, vegetables, and animals, to obey the movements of Nature ; but a great man should have his emotions under command, and only as he exercises this empire does he merit the name of Great.)

I have just hinted the necessity of *conformity* to artists, who will find it much more difficult to execute, than it is easy for me to criticise. God forbid that I should give a moment's pain to men whose works have given me exquisite pleasure. It was simply my wish to stimulate the ingenious to tread in

the steps of Nature, and pursue that track as far as genius can carry them.

This would be the place to speak of music, for sounds are movements merely : but persons of much ability have treated this noble art with consummate skill. If any foreign testimony could farther confirm me in the principles I have hitherto laid down, it is that of musicians, who have restricted harmonic expression to three sounds. I might, like them, reduce to three terms the elementary generations of colours, forms, and motions ; but they have omitted, in their fundamental basis, the generative principle, *sound*, properly so called, and the negative term, silence ; especially as this last produces powerful effects in the movements of music.

These proportions might be extended to the progressions of tasting ; the most agreeable of them have similar generations, as we know by experience to be the case with regard to most fruits, whose different stages of maturity successively present five savours, namely, the acid, sweet, sugary, vinous, and bitter. They are acid while growing, sweet as they ripen, sugary in a state of perfect maturity, vinous in their fermentation, and bitter in a state of dryness. Farther, we should find the most agreeable of these savours, namely, the sugary, is that which occupies the middle place in this progression, of which it is the harmonic term ; that, from its nature, it forms new harmonies, by a combination with its extremes ; for the beverages most grateful to the palate consist of acid and sugar, as the refreshing liquors prepared with citron-juice ; or of sugar and bitter, such as coffee.

Though I have a thorough conviction of the truth of these elementary generations, it would not, however, surprise me, should many of my readers dissent from what I have advanced. [Our natural tastes are perverted by prejudices which determine our physical sensations, much more powerfully than these last give direction to our moral affections. I shall endeavour, in another place, to unfold the causes of these moral affections. They stand in connexion with laws more sublime than any physical laws : while these last amuse our senses, the others speak to the heart, and calmly admonish us, that man is ordained to a much higher destination.] All I have hitherto said on this subject, or hereafter may say, is reducible to this great law : Every thing in Nature is formed of contraries : from their harmonies the sentiment of

pleasure results, and out of their oppositions issues the sentiment of pain.

This law extends also to morals. Every truth, those of fact excepted, is the result of two contrary ideas. It follows, that as often as we decompose a truth, by dialectics, we divide it into the two ideas of which it is constituted; and if we confine ourselves to one of its elementary ideas, as to a detached principle, and deduce consequences from it, we shall convert it into a source of endless disputation; for the other elementary idea, if pursued, will supply consequences diametrically opposite, themselves susceptible of contradictory decompositions without end. The schools are admirably adapted to instruct us how to manage this process, and thither are we sent to form our judgment.

✕ All disorders, both physical and moral, are but the clashing opposition of two contraries. If man would pay attention to this law, wranglings and mistakes would speedily cease; for every thing being composed of contraries, whoever affirms a simple proposition is only half right, as the contrary proposition has equally an existence in nature.

There is perhaps in the world but one intellectual truth, pure, simple, and without contradiction. Those who have denied it only support their negation on the apparent disorders of Nature, the extreme principles of which alone they contemplated; so that they have not demonstrated that God did not exist, but that He was not intelligent or good. Their error proceeds from their ignorance of natural laws. Besides, their arguments have been mostly founded on the disorders of men, who exist in an order different from that of Nature, and who alone of all beings endowed with perception have been committed to their own direction.)

As to the nature of God, I know that faith itself presents Him to us as the harmonic principle, not only with relation to all that surrounds Him, of which he is the Creator and Mover, but even in his essence divided into three persons. A single act of his will called us into being; the slightest communication of his works is sufficient to illuminate our reason; but I have a thorough persuasion that if the smallest ray of his divine essence were to communicate itself directly to us, in a human body, we must be annihilated.

OF CONSONANCES.

Consonances are repetitions of the same harmonies. They increase our pleasures by multiplying and transferring the enjoyment of them to new scenes. They farther communicate pleasure by convincing us that the same Intelligence has presided over the different plans of Nature, presenting throughout similar harmonies. Consonances accordingly confer more pleasure than simple harmonies, as they convey the sentiments of extension and divinity, so congenial to the human soul. Natural objects excite satisfaction only as they awaken intellectual feeling.

The most beautiful harmonies are those which have the most consonances. * Nothing is more beautiful than the sun, nothing in nature so frequently repeated as his form and light. He is variously reflected by refractions of the air, which exhibit him above the horizon before he is actually risen, and after he has set ; by the parhelia, which reflect his disk sometimes twice or thrice in the misty clouds of the north ; by the rainy clouds, in which his refracted rays trace an arch shaded with a thousand various colours ; and by the waters, whose reflexes exhibit him where he is not, in the bosom of meadows, amidst flowers besprinkled with dew, and in the shade of green forests. The dull and inert earth, too, reflects him in the specular particles of gravels, micas, crystals, and rocks. It presents to us the form of his disk and rays in the disks and petals of the myriads of radiated flowers with which it is covered. In a word, this beautiful star has multiplied himself into infinity with unknown varieties, in the innumerable stars of the firmament, which he discovers to us when he quits our horizon ; as if he had withdrawn himself from the consonances of the earth only to display to the delighted eye those of heaven.

From this law of consonance it follows that what is best and beautiful in Nature, is also common and most frequently repeated. To it we must ascribe the varieties of species in each genus, the more numerous as that genus is useful. There is no family in the vegetable kingdom so necessary as the gramineous, on which subsist not only quadrupeds but birds and insects, and there is no one whose species are so varied. The millet of Africa, the maize of Brazil, the rice of Asia, the palm-sago of the Moluccas, the trunks of which

are filled with alimentary flour, are in consonance with the corns of Europe. We shall find consonances of another kind in the same places, as if it had been the intention of Nature to multiply her benefits by varying only the form of them, without changing almost anything of their qualities. Thus in our gardens, what a delightful and beneficial consonancy there is between the orange and citron trees, the apple and the pear, the walnut and the filbert; and in our farm-yards between the horse and the ass, the goose and the duck, the cow and the she-goat.

× Although each genus is in consonancy with itself from difference of sex, there are between the sexes contrasts giving energy to their loves from the very opposition of contraries, from which all harmony takes its birth; but without the general consonancy of form between them, sensible beings of the same genus never would have approached each other. Without this, one sex would have remained a stranger to the other. Before each could have observed what the other possessed that corresponded to its necessities, the time of reflection would have absorbed that of love, and perhaps extinguished desire. It is consonancy which attracts, and contrast which unites them. There is not in any one genus an animal of one sex entirely different from one of the other in exterior forms; and if such differences are actually found, as certain naturalists pretend, in several species of fishes and insects, I am persuaded Nature placed the habitation of male and female very close to each other, and planted their nuptial couch near their cradle.

There is a consonancy of forms more intimate still than even that of the two sexes, I mean the duplicity of the organs of each individual. Every animal is double. If you consider his two eyes, his two nostrils, his two ears, the number of his legs and arms disposed by pairs, you would be tempted to say, here are two animals glued the one to the other; and united under the same skin. Nay, the single parts of his body, as the head, tail, and tongue, appear to be formed of two halves, compacted together by seams. It is not so with the members properly so called: for example, one hand, one ear, one eye, cannot be divided into two similar halves; but the duplicity of form in the parts of the body distinguishes them essentially from the members; for the part of the body is double, and the member is single; the former is always single and alone,

and the latter always repeated. Thus the head and tail of an animal are parts of its body, and the legs and ears are members.

✕ This most wonderful law of Nature destroys all the hypotheses which introduce chance into the organization of beings; for independently of its harmonies, it doubles the proofs of a Providence, who did not deem it sufficient to give one principal organ to animals adapted to each element in particular, such as the eye for the light, the ear for sound, the foot for the ground, but determined that they should have each of those organs by pairs.

Certain sages have considered this admirable duplication as a predisposition of Providence, that the animal might always be able to supply the loss of one of the double organs, exposed as they are to so many accidents; but the interior parts of the body, which at first sight appear to be single, present on closer examination a similar duplicity of forms, even in the human body, where they are more confounded than in other animals. Thus the five lobes of the lungs, one of which has a kind of division; the fissure of the liver; the supernal separation of the brain by the duplication of the *dura-mater*; the *septum lucidum*, similar to a leaf of talc, which separates the two anterior ventricles of it; the two ventricles of the heart; and the divisions of the other *viscera* announce this double union, and seem to indicate, that *the very principle of life is the consonance of two similar harmonies*.

From this duplicity of organs there results more utility than if they had been single. Man with two eyes can take in at once more than half the horizon, with one only he could scarcely have embraced a third part. Provided with two arms he can perform many actions he never could have accomplished with but one, such as raising upon his head a load of considerable size and weight, and clambering up a tree. Had he been placed upon one leg, not only would his position be much more unsteady than on two, but he would be unable to walk; his progressive motion would be reduced to crawling or hopping, producing discord to the other parts of his body, and the variety of soils over which he is destined to move.

If Nature has given a single exterior organ to animals, as the tail, it is because its use extends but to a single action, to which it is fully equivalent. Besides, the tail from its situa-

tion is secured against danger, and hardly any but very powerful animals have a long tail, as bulls, horses, and lions. Rabbits and hares have it very short. In feeble animals which have one of considerable length, as the thornback, it is armed with prickles, or else it grows again, if it happens to be torn off by an accident, as in the case of a lizard. Finally, whatever may be the simplicity of its use, it is formed of two similar halves, as the other parts of the body.

There are other interior consonances, which collect diagonally the different organs of the body, to form but one only and single animal of its two halves. [I leave to anatomists the investigation of this incomprehensible connexion; but the cruel experiments every day made on brutes, to discover these secret correspondencies of Nature, serve only to spread a thick veil over them; and the barbarous means employed by our modern physics, have an influence still more fatal on the morals of those who practise them; for, together with false information, they inspire them with the most atrocious of all vices, cruelty.]

If man may presume to put questions to Nature respecting the operations she is pleased to conceal, I should prefer the road of pleasure to that of pain. Of the propriety of this sentiment I witnessed an instance at a country-seat in Normandy. Walking in an adjoining field with a young gentleman, we perceived bulls fighting. He ran to them with his staff brandished, and the poor animals instantly gave up their contention. He went up to the most ferocious, and began to tickle him at the root of the tail. The animal, whose eyes were still inflamed with rage, became motionless, with outstretched neck, expanded nostrils, transpiring the air with a satisfaction which most amusingly demonstrated the intimate correspondence between this extremity of his body and his head.

The duplicity of organs is farther observable in the essential parts of vegetables, as the *antheræ* of the flowers, which are double bodies: in their petals, one half corresponding exactly to the other; in the lobes of their seed, &c. A single one of these parts, however, appears sufficient for the expansion and generation of the plant. This observation applies to the very leaves, the halves of which are mostly correspondent; and if any one recedes from this order, undoubtedly the reason is worthy of investigation.

These facts confirm the distinction between the parts and

members of a body ; for in leaves where this duplicity occurs the vegetative faculty is usually to be found, which is diffused over the body of the vegetable itself ; so that if you carefully replant those leaves at the proper season, the complete vegetable will thence be reproduced. Perhaps it is because the interior organs of the tree are double that the principle of vegetative life is diffused even over its slips, which sprout again from one branch. Nay, some have the power of perpetuating themselves by cuttings simply. Of this we have a noted instance in the Memoirs of the Academy of Sciences. Two sisters became heiresses of an orange-tree ; each insisted on having it thrown into her allotment. At length, after much wrangling, and neither being disposed to resign her claim, it was settled that the tree should be cleft in two, and each take her half. The orange-tree underwent the judgment pronounced by Solomon on the child — it was cleft asunder : each sister replanted her own half, and, wonderful to be told ! the tree which had been separated by unsisterly animosity, received a new clothing of bark from the benignant hand of Nature.

This universal consonance of forms suggested to man the idea of symmetry. He has introduced it into most of the works of art, particularly architecture, as an essential part of order. To such a degree is it the work of intelligence and combination, that I consider it as the principal character by which we distinguish organized bodies from such as are not so, however regular their assemblage may appear.

In conformity to these reflections, on considering the globe of the earth, I observed that it too presented a duplicity of form. From the beginning it had been my idea that this globe, being the production of an Intelligence, order must pervade it. I had discerned the utility of islands, and even of banks, and of rocks, to protect the parts of continents most exposed to the currents of the ocean, at the extremities of which they are always situated. I had also seen the utility of bays, removed from the currents of the ocean, and hollowed into deep retreats to shelter the discharge of rivers, and serve, by the tranquillity of their waters, as an asylum to the fishes, which retire thither to collect the spoils of vegetation there disgorged by the rivers. I had admired them in detail, but had formed no conception of their combination. ✕ My mind was bewildered, and I should without hesitation have ascribed

the whole to chance, had not the order I perceived in each of the parts suggested to me the possibility that it might exist also in the totality of the work.

I shall now display the globe under a new aspect. The reader will pardon a digression which exhibits to him one little fragment of the materials I had laid up for a geographical structure, but which tends to prove the universality of the laws I am endeavouring to establish.

✓ I first endeavoured to find out consonances between the northern and southern halves of the globe, but perceived only oppositions; the northern being, if I may so express myself, a terrestrial hemisphere, and the southern a maritime, and so different from each other, that the winter of one is the summer of the other; and the seas of the first hemisphere seem to be opposed to the lands and islands scattered over the second. This contrast presented another analogy with an organized body, for every organized body has two halves in contrast, as there are two in consonance.

I found in it then something like analogy with an animal, whose head should have been to the north, from the attraction of the magnet peculiar to our pole, which seems there to fix a *sensorium*, as in the head of an animal: the heart under the line, from the constant heat of the torrid zone, which seems to determine this as the region of the heart: finally, the excretory organs in the southern part, in which the greatest seas, the vast receptacles of the alluvions of continents, are situated; and where we likewise find the greatest number of volcanoes, which may be considered as the excretory organs of the seas, whose bitumens and sulphurs they consume. Besides, the sun, who sojourns five or six days longer in the northern hemisphere, seemed to present to me a more marked resemblance to the body of an animal, in which the heart, the centre of heat, is somewhat nearer to the head than to the lower extremities.

Though these contrasts appeared sufficiently determinate to manifest order on the globe, and though I perceived something similar in vegetables distinguished into two parts, opposite in functions and forms, as the leaves and roots; I was afraid of giving scope to my imagination, and attempting to generalize the laws of Nature peculiar to each existence, by extending them to kingdoms not susceptible of the application. But I ceased to doubt of the general order of the

globe, when with two halves in contrast I found two others in consonance. I was astonished, I confess, when I observed in its duplicity of forms members exactly repeated on that side and on this.

✧ The globe, considered from east to west, is divided, as all organized bodies are, into two similar halves, the Old and New World. Each part mutually corresponds in the eastern and western hemispheres. The lakes of Finland and the gulf of Archangel correspond to the lakes of Canada and Baffin's Bay ; Nova Zembla to Greenland ; the Baltic to Hudson's Bay ; the islands of Great Britain and Ireland, which cover the first of these mediterraneans, to the islands of Good Fortune and Welcome, which protect the second ; the Mediterranean, properly so called, to the Gulf of Mexico, which is a kind of mediterranean formed in part by islands. At the extremity of the Mediterranean we find the isthmus of Suez in consonance with the isthmus of Panama, placed at the bottom of the gulf of Mexico. Conjoined by those isthmuses the peninsula of Africa presents itself in the Old World, and the peninsula of South America in the New. The principal rivers of these divisions of the globe front each other in like manner ; for the Senegal discharges itself into the Atlantic directly opposite to the river of the Amazons. Finally, each of these peninsulas, advancing toward the south pole, terminates in a cape equally noted for violent tempests, the Cape of Good Hope and Cape Horn.

There are between these two hemispheres many other points of consonance on which I shall no longer insist. These different particulars, it is admitted, do not correspond exactly in the same latitudes ; but they are disposed in the direction of a spiral line winding from east to west, and extending from north to south, so that these corresponding points proceed in a regular progression. They are nearly of the same height, setting out from the north, as the Baltic and Hudson's Bay ; and they lengthen in America, in proportion as it advances toward the south. This progression is perceptible along the Old Continent, as may be seen from the form of its capes, which, taking the point of departure east, lengthen so much more south as they advance toward the west ; such as the Cape of Kamtschatka in Asia, Cape Comorin in Arabia, the Cape of Good Hope in Africa, and finally, Cape Horn in America.

These differences of proportion are to be accounted for from this, that the two terrestrial hemispheres are not projected in the same manner ; for the Old Continent has its greatest breadth from east to west, and the New its greater extent from north to south ; and it is manifest this difference of projection has been regulated by the AUTHOR of Nature for the same reasons which induced him to bestow double parts on animals, in order that, if necessity required, the one might supply what was deficient in the other, but principally that they might be of mutual assistance.

If, for example, there existed only the ancient continent with the South Sea alone, the motion of that sea being much accelerated under the line by the regular winds from the east, would, after having surrounded the torrid zone, advance with incredible fury, and attack tremendously the land of Japan : for the size of the billows of the sea is always in proportion to its extent. But from the disposition of the two continents the billows of the great eastern current of the Indian Ocean are partly retarded by the archipelagoes of the Moluccas and Philippine Islands ; they are still farther broken by other islands, such as the Maldivia, by the capes of Arabia, and by that of Good Hope, which throws them back toward the south. Before they reach Cape Horn they have to encounter new obstacles from the current of the south pole, which then crosses their course, and the change of the monsoon, which totally destroys the cause of the commotion at the end of six months. Thus there is not a single current, easterly or northerly, which pervades so much as a quarter of the globe in the same direction. Besides, the division of the parts of the globe into two, is so necessary to its general harmony, that if the channel of the Atlantic Ocean, which separates them, had no existence, all the oriental rivers of America and the occidental of Europe would be dried up ; for those rivers owe their supplies only to the clouds which emanate from the sea. Besides, the sun enlightening on our side only one terrestrial hemisphere, the mediterraneans of which would disappear, must burn it up with his rays ; and at the same time, as he warmed on the other side a hemisphere of water only, most of the islands of which would sink of course, because the quantity of that sea must be increased by the subtraction of ours, an immensity of vapour would arise and go merely to waste.

[It would appear that, from these considerations, Nature has not placed in the torrid zone the greatest length of the continents, but only the mean breadth of America and Africa, because the action of the sun would there have been too vehement. She has placed there, on the contrary, the longest diameter of the South Sea, and the greatest breadth of the Atlantic Ocean, and there she has collected the greatest quantity of islands in existence.] Farther, she has placed in the breadth of the continents, there lengthened out, the greatest bodies of running water in the world, all issuing from mountains of ice. Again, for this reason, she has multiplied in the torrid zone and its vicinity, lofty chains of mountains covered with snow, and she directs thither the winds of the north and south pole, of which the trade-winds always partake. Several of the great rivers which flow there are not situated precisely under the line, but in regions of the torrid zone, hotter than the line itself.

From all this we have a glimpse of the necessity of two continents, mutually to check the movements of the ocean. [Nature could not have disposed them otherwise, than by extending one lengthwise and the other in breadth, that the opposed currents of their ocean might balance each other, and that there might thence result a harmony adapted to their shores, and to the islands contained in their basons.]

Were we to suppose these two continents projected circularly, from east to west, under the two temperate zones, the circulation of the sea contained between them would be too violently accelerated by the east wind. There could be no longer any communication by sea from the line toward the poles; consequently no icy effusions in that ocean, no tides, no cooling, and no renovation of its waters. If we suppose, on the contrary, both continents extended from north to south, as America is, there would be no longer any oriental current in the ocean; the two halves of each sea would meet in the midst of their channel, and their polar effusions would there encounter each other with an impetuosity of commotion, of which the icy effusions precipitated from the Alps convey but a faint idea. But by the alternate and opposite currents of the seas the icy effusions of our pole proceed, in summer, to cool Africa, Brazil, and the southern parts of Asia, forcing its way beyond the Cape of Good Hope, by the monsoon, which then carries the current of the ocean towards the east

and during our winter the effusions of the south pole proceed towards the west, to moderate on the same shores the action of the sun, which is there unremitting. [By means of these two spiral motions of the seas, similar to those of the sun in the heavens, there is not a single drop of water but what may make the tour of the globe by evaporation under the line, dissolution into rain in the continent, and congelation under the pole. These universal correspondences are so much the more worthy of being remarked, that they enter into all the plans of Nature, and present themselves in the rest of her works.]

From any other imaginable order would result other inconveniences, which I leave the reader to find out. Hypotheses *ex absurdo* are at once amusing and useful ; they change, it is true, natural proportions into caricatures ; but they have this advantage, that by convincing us of the weakness of our understanding, they impress us with a deep sense of the wisdom of Nature.

OF PROGRESSION.

Progression is a series of consonances ascending or descending. Wherever we meet progression it produces exquisite pleasure, because it excites in the soul a sentiment of infinity.

When the leaves of a vegetable are arranged round its branches, as the branches themselves are round the stem, there is consonancy, as in pines ; but if the branches are farther disposed among themselves on similar plans, diminishing in magnitude, as in the pyramidical form of firs, there is progression ; and if these trees are disposed in long avenues decreasing in height and colouring, like their particular mass, our pleasure is heightened, because the progression becomes infinite.

From this instinct of infinity we take pleasure in viewing every object which presents a progression ; as nursery-grounds, containing plants of different ages, hills flying off to the horizon in successive elevations, perspectives without a termination.

Nature has not formed, after our limited manner, perspectives with one or two consonances ; but she composes them of a multitude of different progressions to be found in the minutest of her works, of which they constitute the principal charm. They are not the effect of any mechanical law, but

have been apportioned to each vegetable, to prolong the enjoyment of its fruit, conformably to the wants of man. Some appear only during the season of heat; others can be preserved; but those designed to supply the accidental demands of mankind remain on the earth at all times. Not only are these last enclosed in shells for their preservation, but they appear upon the tree at all seasons, and in every degree of maturity. In tropical countries, on the uninhabited shores of the islands,* the cocoa-tree bears at once 12 or 15 clusters of cocoa-nuts, some in the bud, others in flower, others knit, others full of milk, and, finally, some in a state of perfect maturity. The cocoa is the seaman's tree.

The productions of our corn-fields and vineyards present dispositions still more wonderful; for though the ear of corn has several faces, its grains come to maturity at the same time, from the mobility of its straw, which presents them to all the aspects of the sun. The vine does not grow in form of a bush nor of a tree, but in hedge-rows; and though its berries be arranged in form of clusters, their transparency renders them throughout penetrable by the rays of the sun. Nature thus lays men under the necessity, from the spontaneous maturity of these fruits, destined to the general support of human life, to unite their labours, and mutually assist each other in the pleasant toils of the harvest and the vintage. The corn-field and the vineyard may be considered as the most powerful cements of society; for although nature has refused to the corn-plant and the vine the power of yielding their fruits at all seasons of the year, she has bestowed on the flour of the one and the wine of the other, the quality of being preservable for ages.

OF CONTRASTS.

Contrasts differ from contraries in this, that contraries act but in one single point, and contrasts in their general combination. An object has but one contrary, but may have many contrasts. White is the contrary of black; but it contrasts with blue, green, red, and various other colours.

× Nature, to distinguish the harmonies, consonances, and progressions of bodies, makes them exhibit contrasts. This law is the less observed, being common. Naturalists consider

* See Francis Pyrard's *Voyage to the Maldives*.

the colour of bodies as simple accidents; and look on their very forms as the effect of some attraction, incubation, crystallization, &c. Books are composed to extend by analogies the mechanical effects of those laws to the different productions of Nature; but if they really possess so much power, how comes it that the sun has not long ere now filled the waters, the dry land, the forests, the heavens, the plains, and all the creatures over which he exercises so much influence with the uniform and monotonous effects of his light? All these objects ought to assume his appearance, and present only white or yellow to our eyes, and be distinguished from each other only by their shades. A landscape ought to exhibit no other effects but those of a cameo or of a print. Latitudes, we are told, diversify the colour of them. But if latitudes have this power, how comes it to pass that the productions of the same climate and of the same field have not all the same tints? Whence is it that quadrupeds, which are born and die in the meadow, do not produce young ones green as the grass on which they feed?

[Nature has not satisfied herself with establishing particular harmonies in every species of beings to characterize them, but, that they might not be confounded among themselves, she exhibits them in contrasts.] In general, she has made herbs green, to detach them from the earth, and has given the colour of earth to animals which live on herbage, to distinguish them from the ground on which they stray. This general contrast may be remarked in domestic animals, the yellow beasts of the forests, and all the granivorous birds which live among herbage or the foliage of trees, as the hen, partridge, quail, lark, sparrow, and many others of earthly colours, because they live among verdure. But those who live on dingy grounds are clad in brilliant colours, as the bluish tomtit and the woodpecker, which scramble along the rind of trees in pursuit of insects, and many others.

Nature universally opposes the colour of the animal to that of the ground on which it is destined to live; and this most admirable law admits not a single exception. Flat fishes, but indifferent swimmers, and destined to live at the bottom of the sea, have the colour of the sands where they find their nourishment, being spotted, like the beach, with gray, yellow, black, red, and brown. They are thus speckled, I admit, only on one side; but they are so sensible of this resemblance,

that when enclosed within the parks formed on the strand to entrap them, and observing the tide gradually retiring, they bury their fins in the sand, expecting its return, and present to the eye only their deceitful side. It so perfectly resembles the ground on which they squat to conceal themselves, that it would be impossible for the fishermen to distinguish them from it without the help of sickles, which they draw in every direction along the surface of the sand, to detect by the touch what the eye could not discern. This I have witnessed, more highly amused at the dexterity of the fishes than at that of the fishermen.

Nature has bestowed at once, in the colours of innoxious animals, contrasts with the ground on which they live, and consonances with that which is adjacent, and has superadded the instinct of employing these alternately, as good or bad fortune prompts. These wonderful accommodations may be remarked in most of our small birds, whose flight is feeble and of short duration. (The gray lark subsists among the grass of the plains: if terrified, she glides away, and takes her station between two little clods of earth, where she becomes invisible, and remains in perfect tranquillity.)

The same thing is true of the partridge. I have no doubt that these defenceless birds have a sense of those contrasts and correspondences of colour, for I have remarked it even in insects; it is also conspicuous even in the cameleon, endowed with the incomprehensible faculty of assuming at pleasure the colour of the ground over which he moves.

But in the age of weakness and inexperience Nature confounds the colour of harmless animals with that of the ground on which they inhabit, without committing to them the power of choice. The young of pigeons, and of most granivorous fowls, are clothed with a greenish shaggy coat, resembling the mosses of their nests. Caterpillars are blind, and have the complexion of the foliage and of the barks which they devour. Nay, young fruits, before they are armed with prickles, or enclosed in cases, in bitter pulps, in hard shells, to protect their seeds, are, during the season of their expansion, green as the leaves which surround them. Some embryos, it is true, as those of certain pears, are ruddy and brown, but they are then of the colour of the bark of the tree to which they belong. When those fruits have enclosed their seeds in kernels, or nuts, so as to be in no farther danger,

they then change colour, and give their respective trees their natural contrasts. It is strikingly remarkable, that every fruit which has changed colour has seed in a state of maturity.

The insects, in like manner, having deposited their robes of infancy, and now committed to their own experience, spread about over the world, to multiply the harmonies of it with the attire and instincts which Nature has conferred upon them. Clouds of butterflies, which in their caterpillar state were confounded with the verdure of plants, now oppose the colours and forms of their wings to those of flowers.

✕ Nature does not employ those agreeable correspondences and contrasts in the decoration of noxious animals, nor even of dangerous vegetables. Carnivorous or venomous animals form, at every age, and wherever they are, oppositions harsh and disgusting; but the useful bee is of the complexion of the *stamina* and *calices* of the flowers, where she reaps her innocent harvests.

✕ Poisonous plants also present disgusting contrasts, from the livid colours of their flowers, which are in harsh oppositions with the tender shades; from their nauseous and virulent smells; from their prickly foliage, of a dark-green hue, and clashing with white on the under side, as the aconite tribes.

Such of the brute creation as are intended to live on two different grounds, are impressed with a double contrast in their colours. Thus, for example, the kingfisher, which skims along rivers, is at once musk-coloured and glazed over with azure; so as to be detached from the dusky shores by his azure colour, and from the azure of the waters by his musk colour. The duck, which dabbles on the same shores, has the body tinged of an ash colour, while the head and neck are of an emerald-green, so that he is perfectly distinguishable by the gray colour of his body, from the verdure of the aquatic plants among which he waddles, and by the verdure of his head and neck, from the dark-coloured mud where he finds part of his food, and in which, by another most astonishing contrast, he never soils his plumage.

Nature opposes, then, the colours of every animal to those of the respective ground on which it is to be placed; and what confirms the truth of this law is, that the greatest part of birds which live on one ground only have but a single colour, and that one strongly contrasted with the colour of

the ground. Accordingly, the birds which live aloft in the air, on the azure ground of the heavens, or in the bosom of the waters, in the midst of lakes, are mostly white, which of all colours forms the most striking contrast with blue, and is consequently most adapted to render them perceptible at a distance.

There are others, which, to form a contrast with those last mentioned, detach themselves from the skies and waters by their black or dusky colours: as the crow, which is perceptible at so great a distance in the heavens, on the white ground of the clouds. Hence it may be inferred, that when an animal is invested with but one single tint, he is intended but for one situation; and when he combines in himself the contrast of two opposite tints, that he lives on two grounds, the colours themselves of which are determined by that of the plumage, or hair, of the animal. We must, however, guard against an unlimited generalization of this law, and consider it as harmonizing with the exceptions which wise Nature has established, for the preservation of animals; such as the whitening of them, to the north, in winter, as a remedy against cold, and imbrowning them to the south, during the ardours of summer, to shelter them from the effects of burning. What evidently demonstrates that these great effects of harmony are not mechanical results, is, that among the infinite number of birds which live in the higher regions of the air, or on the surface of the azure seas, there are none of the colour of blue; and that many birds which live between the tropics, in the bosom of black rocks, or under the shade of sullen forests, are azure-coloured.

These harmonies are contrived for the use of man; and as a farther consequence of these correspondences with him, Nature has given to the birds which live remote from him, cries shrill, hoarse, and piercing, which render them perceptible at a distance, amidst their wild retreats. She has bestowed sweet notes and melodious voices on the little birds of our groves, domesticated in our habitations, to heighten our delight, as well by their warbling as by the beauty of their colours.

All the kingdoms of Nature present themselves to man with the same correspondences, the abysses of the ocean not excepted. The fishes which live on animal substances, as the whole class of the cartilaginous do, have disgusting forms

and colours. Fishes which live in the open sea, have colours marbled with white, black, brown, which distinguish them in the bosom of the azure billows. But among those which frequent the dusky shores, and particularly such as are denominated *saxatile*, because they live among rocks, are found fishes, the lustre of whose skin and scales surpasses all the efforts of the pencil, especially when alive. The legions of mackarel and herrings diffuse the radiance of silver and azure over the northern strands of Europe.

Among the black rocks of the seas of the Tropics, the fish known by the name of *captain* is caught, whose colours vary with the latitude. This beautiful fish, says Francis Cauche, which takes pleasure in the rocks, is streaked in form of lozenges ; his scales are of a pale gold colour, and his back coloured and glazed over with laca, inclining toward vermilion. His dorsal fin and tail are waved with azure, fading away into green toward the extremities. Here likewise is found the magnificent fish called the *sardin*, which is adorned with scales of at once a gold and silver hue, crossed from head to tail by black lines, which admirably heighten their lustre.

Wherever you see a brilliant fish, be assured his habitation is near the shore, and that he lives in the open ocean if he is of a dark colour. This truth we may ascertain in the channels and on the banks of our own rivers. The silver smelt and the bray, whose scales are employed in the formation of mock pearls, play on the strand of the Seine ; whereas the eel, of the gloomy colour of slate, takes pleasure to dabble at the bottom of the stream. [We must not, however, pretend to generalize these laws, to the exclusion of exceptions. Nature subjects all to the mutual adaptation of beings, and to the enjoyment of man ; for though the fishes on the shores have, in general, shining colours, there are several species of them invariably of a dark colour.

The saxatile fishes, which can easily ensure their safety among the rocks, by agility in swimming, or by the facility of finding a retreat in their cavernous receptacles, or of there defending themselves against their enemies, by the armour which Nature has bestowed, have all of them lively and shining colours, the cartilaginous excepted. All shell-fish which walk and migrate, and, consequently, have the power of choosing their asylum, are those, in their kind, which have

the richest colours and form, with the different grounds of the sea, secondary harmonies totally unknown : but those which do not change their situation, as most oysters, which frequently adhere to the rocks, or those which are perpetually at anchor in straits, as muscles, or those, in a word, which I believe are blind, like our land-snails, are of the colour of the ground they inhabit, to be less perceptible to their enemies.

It is impossible to ascribe, as in the shell-fish of India, colours so charming to the action of the sun on those shells, covered as they are with tartars and rough coats ; we may venture to affirm, that Nature has veiled their beauty, only to preserve it for the enjoyment of man, and placed them only on the verge of the shores, where the sea purifies, by tossing them about, to put them within his reach. Thus she places the most brilliant shells in regions the most exposed to the ravages of the elements ; and presents to the poor Patagonians spoons and cups, the lustre of which far surpasses the richest plate of polished nations.

Hence it may be inferred, that fishes in general, and shell-fish in particular, which have two opposite colours, live on two different grounds, as we have observed in the case of birds, and that those which have only one colour frequent only one ground.

It must not be concluded, on the other hand, that such shell-fish are indebted for their colours to the rocks on which they adhere by suction ; for it would thence follow, that the rocks of Magellan's strait, which produce muscles and limpets so rich in colouring, should be themselves inlaid with mother-of-pearl, opal, and amethyst ; besides, every rock maintains shell-fish of very different colours. Many of those marine harmonies have escaped me, for I then considered them as merely the effect of chance. I looked at and admired them, but I observed them not : I suspected, however, even then, that the pleasure which their harmonic combination inspired, must be referable to some with which I am unacquainted.

Enough has been said to demonstrate how much naturalists have mutilated the finest portion of natural history, by retailing isolated descriptions of animals and plants, without noticing the season when, and the place where, they are to be found. By this negligence they strip them of all their beauty, for there is not an animal or plant existing, whose harmonic point is not fixed to a certain situation, to a certain hour of

the day or night, to the rising or setting sun, to the phases of the moon, nay, to the very tempests ; to say nothing of the other contrasts and correspondences resulting from these.

I am so thoroughly persuaded of the existence of all those harmonies, that I doubt not, on seeing the colour of an animal, one might determine nearly that of the ground it inhabits ; and by following up those indications, a road might be paved to curious discoveries.

We meet with those contrasts even in the brute soils of the earth. If a uniform and mechanical cause had produced the globe of the earth, it must have been universally of the same matter and colour : the hills, mountains, rocks, and sands, must have been amalgams, or the rubbish, of each other ; but this is not found to be the case in any one district, however small. In the same canton may be found red mountains, black rocks, white plains, and yellow sands ; with substances as much varied as their colour. I shall for the present only recommend to naturalists to study Nature, as the great painters do, by uniting the harmonies of the three kingdoms. Every one who observes in this manner, will find a new light diffused over the perusal of voyages and of natural history, though their authors scarcely ever speak of those contrasts. But every man will be himself in a condition to discover their delightful effects, in what is called brute Nature, I mean that with which man has not intermeddled. As often as a natural object presents to you a sentiment of pleasure, you may rest assured it exhibits some harmonic concert.

Beyond doubt, animals and plants of the same climate have not received from the sun, nor the elements, liveries so varied, and so characteristic. Many new observations may be made upon their contrasts. XHe who has not seen them in their natural place, has not yet become acquainted with their beauty or deformity. Not only are they in opposition to the grounds of their respective habitations, but also between themselves, as to genus and genus ; and it is worthy of remark, that when these contrasts are established, they exist in all the parts of the two individuals. We shall speak of those plants in the following Study, by simply glancing at that delightful and inexhaustible subject.

Those of animals are still farther extended ; they are opposed in forms, gestures, and instincts ; and with differences so decidedly marked, they love to associate with each other,

in the same places. This consonance of tastes distinguishes beings in contrast, from those which are contrary, or enemies. Thus the bee and the butterfly extract the nectar of the same flowers; and the single-hoofed horse, snuffing up the wind, with his mane flowing over his graceful neck, delights to amble about airily over the same meadows on which the ponderous bull impresses his cloven foot; the dull and steady ass takes pleasure in scrambling over the rocks where the capricious goat frisks and bounds; the cat and dog live peaceably by the same fireside, unless where the tyranny of man has vitiated their dispositions, by a treatment calculated to excite hatreds and jealousies between them.

Finally, contrasts exist not only in the works of Nature in general, but in each individual in particular, and constitute, as well as consonances, the organization of bodies. If you examine one of those bodies, of whatever species, you will remark in it forms absolutely opposite, and, nevertheless, consonant. It is thus that, in animals, the excretory organs contrast with those of nutrition. The long tails of horses and bulls are opposed to the large size of their heads and necks, and come in as a supplement to the motions of these anterior parts, too unwieldy to drive away the insects that infest them. On the contrary, the broad tail of the peacock forms a contrast with the length of the neck, and smallness of the head, of that magnificent bird. The proportions of other animals present oppositions no less harmonic, nor less happily adapted to the necessities of each species.

× Harmonies, consonances, progressions, and contrasts, must, therefore, be reckoned among the first elements of Nature. To those we are indebted for the sentiments of order, beauty, pleasure, which spring up in the mind at sight of her works; and from her absence arise the uneasy feelings of disorder, ugliness, languor, and disgust. They extend equally to all the kingdoms; and though I have limited myself to an examination of their effects in the vegetable kingdom only, it is impossible to deny myself the pleasure of indicating them, at least, in the human figure. Here Nature has combined all the harmonic expressions in their highest degree of excellency. All I can do is to trace a feeble sketch of it. Neither have I leisure to arrange more than a part of my observations on this vast and interesting subject. But the little which I am going to advance will be sufficient to over-

turn the position maintained by men of celebrity in the world of science, namely, That human beauty is arbitrary.

OF THE HUMAN FIGURE.

All the harmonic expressions are combined in the human figure. Observe the form of the head of man, which approaches to the spherical, *the* form, by way of excellence. I do not believe this configuration is common to it with that of any animal whatever. On its anterior part is traced the oval of the face, terminated by the triangle of the nose, and encompassed by the radiations of the hair. The head is supported by a neck of considerably less diameter than itself, which detaches it from the body by a concave part.

This slight sketch presents, at the first glance, the five harmonic terms of the elementary generation of forms. The hair exhibits lines; the nose the triangle; the head the sphere; the face the oval; and the void under the chin the parabola. The neck, which, like a column, sustains the head, exhibits, likewise, the very agreeable harmonic form of the cylinder, composed of the circular and quadrilateral.

These forms, however, are not traced in a stiff and geometrical manner, but imperceptibly run into each other, and mutually blend, as parts of the same whole. The hair does not fall in straight lines, but flowing ringlets, and harmonizes with the oval of the face; the triangle of the nose is neither acute, nor a right angle; but, by the undulatory swelling of the nostrils, presents a harmony with the heart form of the mouth, and, sloping towards the forehead, melts away into the cavities of the eyes. The spheroid of the head also amalgamates with the oval of the face. The same thing holds with respect to the other parts, as Nature employs, in their general combination, the roundings of the forehead, cheeks, chin, and neck, that is, portions of the most beautiful of the harmonic expressions, namely, the sphere.

There are, farther, proportions which form, with each other, pleasing harmonies and contrasts: as that of the forehead, which presents a quadrilateral form, in opposition to the triangle, composed of the eyes and mouth; and that of the ears, formed of very ingenious acoustic curves, not to be met with in the auditory organ of animals, because, in mere animals, the ear collects not, like that of man, all the modulations of speech.

But I must expatiate more at large on the charming forms assigned by Nature to the eyes and mouth, placed in the full blaze of evidence, as the two active organs of the soul. The mouth consists of two lips, the upper moulded into the shape of a heart, that form so lovely as to have become proverbial for its beauty ; and the under rounded into a demi-cylindric segment. In the opening between the lips, we have a glimpse of the quadrilateral figure of the teeth, whose perpendicular and parallel lines contrast most agreeably with the round forms adjoining, and so much the more, as we have seen, that the first generative term being brought into union with the supremely excellent harmonic term, that is, the straight line with the spherical form, the most harmonic of all contrasts results from it.

The same relations are to be found in the eyes, the forms of which combine still more the harmonic elementary expressions ; as it was fit the chief of all the organs should do. They are two globes, fringed on the lids with eyelashes, radiating with divergent pencil strokes, which form with them a most delightful contrast, and present a striking consonance with the sun, after which they seem to have been modelled, having, like that orb, a spherical figure, encircled with divergent rays in the eyelashes ; having a movement of self-rotation, and possessing the power, like him, of veiling themselves in clouds by means of their lids.

The same elementary harmonies may be traced in the colours of the head, and in its forms ; in the face we have the pure white exhibited in the teeth and eyes ; then the shades of yellow, which dissolve into its carnation, as painters well know ; after that the red, the eminently excellent colour, which glows on the lips and cheeks. You farther remark the blue of the veins, and sometimes that of the eyeballs ; and finally, the black of the hair, which, by its opposition, gives relief to the colours of the face, as the vacuum of the neck detaches the forms of the head.

Observe, that Nature employs not, in decorating the human face, colours harshly opposed ; but blends them, as she does the forms, softly and insensibly into each other. Thus, the white melts here into yellow, there into red. The blue of the veins has a greenish cast. The hair is rarely of a jet black ; but brown, chestnut, flaxen, and in general of a colour into which a slight tint of the carnation enters, to prevent a

violently harsh opposition. She also employs spherical segments in forming the muscles which unite the organs, and particularly to distinguish these organs she makes use of red. She has accordingly extended a slight shade of it to the forehead, which is strengthened upon the cheeks, and applied pure and unmixed to the mouth, that organ of the heart, where it forms a most agreeable contrast with the whiteness of the teeth. The union of this colour with that harmonic form, is the most powerful consonance of beauty ; and it is worthy of remark, that wherever the spherical forms swell, there the colour strengthens, except in the eyes.

As the eyes are the principal organs of the soul, they are destined to express all its emotions, which could not have been done with the harmonic red tint, for this would have given but one single expression. Nature, in order there to express the contrary passions, has united in the eye the most opposite of colours, the white of the orbit and the black of the iris, and sometimes of the ball, which form a very harsh opposition, when the globes of the eye are displayed in the full extent of their diameter ; but by means of the eyelids, which man can contract or dilate at pleasure, he is enabled to give them the expression of all the passions, from love to fury.

Those eyes whose balls are blue are naturally the softest, because the opposition is then less harsh with the adjacent white ; but they are terrible when animated with rage, from a moral contrast, which constrains us to consider those as the most formidable of all objects, that menace evil, after having encouraged us to expect good. Persons, therefore, thus distinguished, ought to be carefully on their guard against treachery to that character of benevolence bestowed on them by Nature ; for blue eyes express, by their colour, something enchantingly celestial.

The movements of the muscles of the face would be difficult to describe, though it might be possible to explain their laws. They must of necessity be referred to the moral affections. Those of joy are horizontal, as if the soul, in the enjoyment of felicity, had a disposition to extend itself. Those of chagrin are perpendicular, as if, under the pressure of calamity, the mind was looking toward Heaven for refuge, or seeking it in the bosom of the earth. In the alterations of colours, and contractions of forms, we shall discover the

truth of the principle we have laid down, that the expression of pleasure is in the harmony of contraries, blending with each other in colours, forms, and motions ; and that the expression of pain consists in the violence of their oppositions. The eyes alone have motions ineffable ; under the influence of strong emotions, they are suffused with tears, and thus seem to have a farther analogy with the orb of day, who, in the season of tempests, shrouds himself in rainy distillations.

The principal organs of sense, four of which are placed in the head, have particular contrasts, which detach their spherical by means of radiated forms, and their shining colours by dusky tints. Thus the bright organ of vision is contrasted by the eyebrows ; those of smell and taste by the mustaches ; the organ of hearing, by that part of the hair called the *favourite* lock, which separates the ear from the face ; and the face itself is distinguished from the rest of the head by the beard and hair.

(The human body alone unites in itself the modulations and concerts, inexpressibly agreeable, of the five elementary forms, and the five primordial colours, without exhibiting anything of the harsh and rude oppositions perceptible in the brute creation ;) of it alone the first touch is perceptible, and may be seen completely ; other animals being disguised under hair, feathers, or scales, which conceal their limbs, shape, and skin. Farther, it is the only form which, in its perpendicular attitude, displays all its positions and directions at once ; for you can hardly perceive more of a quadruped, bird, or fish, than one half, in the horizontal position proper to them, because the upper part of their body conceals the under.

Man's progressive motion is subject to neither the shocks nor the tardiness of movement of most quadrupeds, nor to the rapidity of that of birds ; but is the result of movements the most harmonic, as his figure is of forms and colours the most delightful.)

(The more that the consonances of the human figure are agreeable, the more disgusting are its dissonances. Hence, on the face of the earth, nothing is so beautiful as a handsome man, nothing so shocking as a very ugly one.)

This farther suggests a reason why it will be for ever impossible for art to produce a perfect imitation of the human figure, from the difficulty of uniting in it all the harmonies ; and from the still greater difficulty of effecting a complete

combination of those of a different nature. The exertions of painters and sculptors in general do them much honour ; but they demonstrate the weakness of Art, which falls below Nature just in proportion as it aims at uniting more of her harmonies. Instead of blending them, as Nature herself does, Art can only place them in opposition. This proves that harmony results from the union of two contraries, and discord from their collision : and the more agreeable the harmonies of an object are, the more disgusting are its discordances. Hence the real origin of pleasure and dislike, in physics as in morals, and the reason why the same object so frequently excites affection and aversion.

> Many interesting reflections remain to be made on the human figure, especially by connecting with it the moral sensations, which alone give expression to the features. The physical beauty of man is so striking, in the eyes even of the animal creation, that to it principally must be ascribed the empire he everywhere exercises over them. The feeble seek refuge under his protection ; the most powerful tremble at sight of him. The lark will save herself amidst troops of men, when she perceives the bird of prey hovering over her ; the stag, when run down by the hounds, appeals with sobs for relief, to the compassion of persons accidentally passing that way ; the India-hens, under the impulse of love, throw themselves chuckling at the feet of the country people ; and it is well known with what familiarity monkeys and fowls of all kinds approach travellers in the forests of India. But dangerous animals are seized with terror at the sight of man, unless driven from their natural bias by some pressing necessity. An elephant is led about in Asia by a little child ; the African lion retires growling from the cabin of the Hottentot, and seeks for himself a kingdom untrodden by the foot of man ; and the immense whale, amidst his native element, trembles and flees away before the puny bark of the Laplander. [Thus is executed that all-potent law, which secured empire to man, though sunk in guilt and wretchedness : ‘ And the fear of you, and the dread of you, shall be upon every beast of the earth, and upon every fowl of the air ; upon all that moveth upon the earth, and upon all the fishes of the sea ; into your hand are they delivered.’ Gen. ix. 2.]

It is remarkable, that through all Nature, there is no animal, plant, fossil, nor even globe, but what has its consonance

and contrast out of itself, man alone excepted. No one visible being enters into society with him but as his servant or slave. >

We must, undoubtedly, reckon among the human proportions, that law so universal, so wonderful, which produces males and females in equal numbers. Did chance preside over the generations of the human race, as over our alliances, we should one year have an unmixed crop of male children, and another, a race entirely female. Some nations would consist wholly of men, others of women; but all over the globe, the two sexes are born, within the same space of time, equal in number. A consonance so regular demonstrates that a Providence watches over the affairs of mankind, notwithstanding the absurdity and disorder of human institutions. } This is a standing testimony to the truth of our religion, which limits man to one woman in marriage, and by this conformity to natural laws, peculiar to itself, seems alone to have emanated from the AUTHOR of Nature. A religion therefore which permits or connives at a plurality of wives, must be erroneous.

X Ah! how little acquainted are they with the laws of Nature, who, in the union of the two sexes, look for nothing farther than the pleasures of sense! They are only culling the flowers of life, without once tasting its fruit. The fair sex! this is the phrase of our men of pleasure; women are known to them under no other idea. But the sex is fair only to persons who have no other faculty but eyesight. It is, besides, to those who have a heart, the creative sex, which, at the peril of life, carries man for nine months in the womb; the cherishing sex, which suckles and tends him in infancy. It is the pious sex, which conducts him to the altar while yet a child, and teaches him to draw in, with the milk of the maternal breast, the love of a religion which the cruel policy of men would frequently render odious to him. It is the pacific sex, which sheds not the blood of a fellow creature; the sympathizing sex, which ministers to the sick, and handles without hurting them.

+ To no purpose does man pretend to boast of his power and strength; if his robust hands are able to subdue iron and brass, those of the woman, more dexterous and usefully employed, can spin into threads the flax and the fleeces of the sheep. The one encounters gloomy care with the maxims

of philosophy, the other banishes it by sportiveness and gayety. The one opposes to external evils the force of his reason; the other, far happier, eludes them by the mobility of hers. If the man sometimes considers it as his glory to bid defiance to danger in the field of battle, the woman triumphs, in calmly meeting dangers more inevitable, and frequently more cruel, on her bed, and under the banners of pleasure. Thus they have been created to support together the ills of life, and to form by their union the most powerful of consonances, and the sweetest of contrasts.

I am obliged by the plan of my work to refrain from pursuing my reflections on subjects so interesting as the marriage and beauty of man and woman. I must, however, hazard some farther observations, to induce others to dive into this rich mine.

✓ All philosophers who have studied man are agreed, and with good reason, that he is the most wretched of all animals. Most of them have been sensible that an associate was necessary to him to relieve his burdens, and they have made his happiness in part to consist in friendship. This is an evident demonstration of human weakness and misery; for were man naturally strong, he would stand in no need of either associate or assistance.

When the ancients represented perfect friendship, it was always restricted to two; for man is frequently reduced to the necessity of deriving his felicity from the concurring interposition of many beings similar to himself. The principal reason for this restriction is deducible from the nature of the human heart, which from its very weakness is capable of attaching itself only to one object at once; and being compounded of opposite passions that maintain a perpetual counterpoise, is, in some sense, active and passive, and stands in need of loving and being beloved, of comforting and being comforted, of honouring and being honoured, and so on. Those singular affections have ever been associated with virtuous and heroic actions; but when the union comprehended more persons than two, it was speedily dissolved by discord, or if permitted to subsist for any length of time, became famous only for the mischief which it brought on mankind.

If the heart of man admits of but a single object, what judgment shall we form of our modern friendships, embracing as they do, a multiplicity? Undoubtedly if a man has thirty

friends, he can bestow on each of them only the thirtieth part of his affection, and can receive in return no greater proportion of theirs. He must of necessity, therefore, deceive them; for no one is disposed to be a friend by fractions. But, if the truth may be told, such friendships are merely confederacies of ambition; relations interested and purely political, employed in practising mutual illusion, in the view of aggrandizing themselves at the expense of society, which would be productive of unspeakable mischief, were they more closely united and not counterbalanced by opposite confederacies. (Almost all our general associations accordingly issue in intestine wars.)

The AUTHOR of Nature has given to each of us, in our species, a natural friend, completely adapted to all the demands of human life, capable of supplying all the affections of the heart, and all the restlessness of temperament. He says, from the beginning of the world: 'It is not good that man should be alone: I will make him a help meet for him; — and the LORD GOD made woman, and brought her unto the man.'* Woman pleases all our senses by her form and graces. She has in her character every thing that can interest the heart of man at every stage of life. She merits, by the long and painful solitudes she exercises over our infancy, our respect as a mother, and our gratitude as a nurse; afterward, as man advances to youth, she attracts all his love as a mistress; and in the maturity of manhood, all his tenderness as a wife, his confidence as a faithful steward, his protection, as being feeble; and even in old age she merits our highest consideration, as the source of posterity, and our intimacy, as a friend who has been our companion through life. Her gayety, nay, her very caprices, balance at all seasons the gravity and over-reflective constancy of man, and acquire reciprocally a preponderancy over him.

(Thus the defects of one sex, and the excess of the other, are an exact mutual compensation.) They are formed, if I may use the expression, to be grooved into each other, like the corresponding pieces of carpenter's-work, the prominent and retreating parts of which constitute a vessel fit to launch on the stormy ocean of life, and to attain additional strength from the very buffetings of the tempest. Had we not been

* Genesis, chap. ii. ver. 18, 22.

informed by a sacred tradition, that woman was extracted from the side of man ; and though this great truth were not every day manifested, in the wonderful birth of the children of the two sexes in equal numbers, we should be speedily instructed in it by our wants. (Man without the woman, and woman without the man, are imperfect beings in the order of Nature.) But the greater the contrast in their characters, the more complete union there is in their harmonies. It is from their opposition in talents, tastes, and fortunes, that the most intense, the most durable affection is produced. Marriage is therefore the friendship of Nature, and the only real union which is not exposed, like those among men, to estrangement, rivalry, jealousies, and the changes time is effecting in our inclinations.

✕ But wherefore are there so few happy marriages among us ? I answer, because with us the sexes have divested themselves each of its proper nature, and assumed the other ; because the women with us adopt the manners of men from education, and men the manners of women from habit. The women have been despoiled of the graces and talents peculiar to their sex, by the masters, sciences, customs, and occupations of men. There is no way left to bring both back to Nature, but to inspire them with a taste for religion. [By religion I do not mean attachment to ceremonies or systems of theology, but the religion of the heart, pure, simple, unostentatious ; such as it is so beautifully depicted in the Gospel.]

✕ Religion will restore to the two sexes not only their moral character, but physical beauty. (It is not climate, aliment, bodily exercise, nor all these together, which form human beauty ; it is the moral sentiment of virtue, which cannot subsist independently of religion. Aliment and exercise, no doubt, contribute greatly to the magnitude and the expansion of the body, but they have no influence on the beauty of the face, the true physiognomy of the soul. It is not uncommon to see persons tall and robust disgustingly ugly ; with the stature of a giant, and the face of a monkey.)

Beauty of face is to such a degree the expression of the harmonies of the soul, that, in every country, those classes of citizens who are obliged to live with others in a state of constraint, are sensibly the homeliest of society. The truth of this observation may be ascertained, particularly among the noblesse of many of our provinces, who live with each

other in the perpetual jealousy of rank, and with their neighbours of an inferior order in a state of unremitting hostility, for the maintenance of their prerogatives. The same thing does not hold good respecting the noblesse of some other of our provincial districts, and the nobility of other parts of Europe. These, living in good understanding among themselves and with their compatriots, are in general the handsomest men of their nation, because their social and benevolent spirit is not in a state of incessant constraint and anxiety.

✕ To the same moral causes may be referred the beauty of the features of the Greek and Roman physiognomies, where we generally meet with models so exquisite in their statues and medallions. They were beautiful, because happy ; they lived in cordial union with their equals, and in favour with the citizens at large. The descendants of those nations are far from exhibiting a resemblance to their ancestors, though the climate of their country is not in the smallest degree changed.

To render children beautiful, they must be made physically, but, above all, morally happy. You must prevent every possible occasion of vexation, not by kindling in their breasts dangerous and headstrong passions, but by teaching them to curb such as they have from Nature ; and especially, by guarding against the communication of every thing unnatural, such as useless and irksome tasks, emulations, rivalships, and the like.

The ugliness of a child may be imputed to his nurse or preceptor. I have sometimes observed families singularly beautiful. On inquiring into the cause of this, I have found that they were happy ; that the mothers had suckled their own children ; that these had learned their occupations under the paternal roof, and been treated with tenderness ; that their parents were fondly attached to each other ; that they all lived together in a state of liberty and cordiality, which rendered them good, happy, and satisfied.

✕ I have thence deduced, that we frequently make a false estimate of the happiness of human life. On seeing here a gardener with the port of a Roman emperor, and there a great lord with the mask of a slave, I imagined at first Nature had committed a mistake. But experience demonstrates, that the great lord in question, from his birth to his death, is placed in a series of positions, which permit him not to gratify his

own inclinations three times a year. He must do the will, first of his preceptors and masters; in more advanced life, that of his prince, of ministers of state, of his rivals, nay, frequently that of his enemies: thus he finds fetters innumerable in his very dignities. Our gardener passes his life without the slightest contradiction. Like the centurion in the gospel, he says to his servant, Come, and he cometh; and to another, Do this, and he doeth it. This demonstrates that Providence has assigned to our very passions a part widely different from that which society presents to them; for, in cases innumerable, the most unrelenting slavery is imposed with an accumulation of honours; and in the meanest of human conditions we frequently find the possession of the most unbounded empire.

Besides, persons disfigured by the corruptive impression of vicious education and habits, have it in their power to reform their looks; and to acquire a beauty altogether irresistible, by being internally good, gentle, compassionate, sensible, beneficent, and devout. These affections of a virtuous soul will impress on their features celestial characters, beautiful even in old age.

But to no purpose will a man attempt to decorate his countenance with the indications of good qualities to which his heart is a stranger. This false beauty produces an effect still more disgusting than the most decided ugliness: for when, attracted by an apparent goodness, we actually find dishonesty and perfidy, we are seized with horror, as when we find a serpent lurking on a bed of flowers. We are bound to aspire then after moral beauty, that its divine irradiations may be diffused over our features and actions. Though a prince himself may boast of birth, riches, credit, wit, the people to know him must look him in the face. They form their judgment entirely from the physiognomy: it is in every country the first, and frequently the last letter of recommendation.

OF CONCERTS.

Concert is an order formed of several harmonies of various kinds. It differs from simple order in this, that the last is frequently nothing but a series of harmonies of the same species.

Every particular work of Nature presents, in different kinds,

harmonies, consonances, contrasts ; and forms a real concert. It may be remarked, on the subject of those harmonies and contrasts, that vegetables whose flowers have the least lustre are frequented by animals of the most brilliant colours, and that the most highly coloured vegetables serve as an asylum to the duskiest animals. This is particularly evident in countries between the tropics, where the trees and herbage without flowers lodge and support birds, insects, nay, monkies, of the most lively colours.

In our temperate regions most of the birds are dull-coloured, because our vegetables have flowers and fruits with shining colours : our lively coloured birds and insects usually choose for their habitation vegetables that have no apparent flowers. Thus the heath-cock glitters on the gray verdure of the pine, whose apples serve him for food ; and the goldfinch builds his nest in the rough fuller's-thistle. On the contrary, birds of dusky hue inhabit shrubbery with gay-coloured flowers. The black-headed bullfinch builds his nest in the white thorn, and that lovely bird exhibits a farther consonance and contrast with the prickly shrub where he resides, by his blood-stained breast and sweet song. The nightingale with brown plumage delights to nestle in the rose-bush, according to the traditions of the oriental poets, who have sung the loves of that melancholy bird for the rose.

If to each plant are added its elementary harmonies, as those of the season when it appears, of the soil in which it vegetates, the effects of the dews, and the reflexes of the light on its foliage, the movements it undergoes from the action of the winds, its contrasts and consonances with other plants, and with quadrupeds, birds, and insects peculiar to it, and a delightful concert will be formed, the harmonies of which are still unknown to us. By pursuing this track alone we can obtain a glimpse of the magnificent edifice of Nature. I would entreat naturalists, persons fond of gardening, painters, nay poets, thus to prosecute their studies, and to take frequent draughts from this perennial spring of taste and delight.

I know not at present what name I ought to give to the conformities those particular concerts have with man. Certain it is, that every work of Nature strengthens its particular concert by the habitation of man, and communicates to it some expression of grandeur, gayety, terror, or majesty. She raises the physical character of her works to a sublime

moral character, by collecting them around mankind. She not only employs particular concerts to express them, but when she means to expose them on the great scale, she combines a multitude of similar harmonies and contrasts to form one great general concert, which has only a single expression, let the field of representation be ever so extensive.

To express, for example, the maleficent character of a venomous plant, she combines in it clashing oppositions of forms and colours, the indications of that maleficence; as retreating and bristly forms, livid colours, dark greens with white and black spots, virulent smells.....But when a whole district is to be characterized as unwholesome, she collects a multitude of similar dissonances. The air is loaded with thick fogs, the turbid waters exhale only nauseous smells, no vegetable thrives on the putrid soil but such as are disgusting, the dracunculus, for instance, the flower of which exhibits the form, the colour, and the smell of an ulcer. The yew-tree only arises in the cloudy atmosphere, whose red trunk and gloomy foliage serves as an asylum to owls. If any animal seeks a retreat under its lurid shade, it is the blood-coloured centipede, or the toad crawling over the humid and rotten ground. By these, or similar signs, Nature scares man away from noxious situations.

If she intends to give him at sea the signal of an impending tempest, as she has opposed in ferocious animals the fiery glare of the eye to the thickness of the eyebrows; their stripes and spots to the yellow colour of their skin, and the stillness of their movements to the thundering noise of their voices; she collects also in the sky and on the deep many clashing oppositions, which in concert announce approaching devastation. Dark clouds sweep through the air in the most horrible forms; here and there the pale fire of lightning bursts from the gloom; the noise of thunder from their dark womb resounds like the roaring of the celestial lion. The orb of day, scarcely visible through their rainy and multiplied veils, emits long radiations of a wan and sickly light. The leaden surface of the ocean sinks and swells into broad and white foaming surges. A hollow murmuring noise seems to issue from those threatening billows. The black shallows whiten at a distance, with horrid sounds, from time to time interrupted by ominous silence. The sea, which alternately covers and reveals them, displays to the light of day their

cavernous foundations. The Norwegian lom perches on one of their craggy points, uttering lamentable cries, like those of a drowning man. The sea ospray rises aloft in the air, and not daring to commit herself to the impetuosity of the winds, struggles with a plaintive screaming voice against the tempest, which bends back her stubborn wings. The black procellaria flutters about, grazing the foam of the waves, and seeks, in the cavity of their moving valleys, a shelter from the fury of the winds. If this small and feeble bird happens to perceive a ship in the midst of the sea, he flees for refuge along her side, and as a reward for the protection which he solicits, announces the tempest to the mariner before it overtakes him.

Nature uniformly proportions the signs of destruction to the magnitude of the danger. Every storm has its peculiar character in particular latitudes; those of summer are unlike those of winter; and widely different is the spectacle of an enraged sea, shining at noonday under the rays of the sun, and that of the same sea illuminated, at the midnight hour, by a single flash of lightning. Nature frequently accompanies the signs of the disorder which agitates the ocean, with agreeable expressions of harmony, that serve only to redouble the horror of the scene. Tempests, off the Capes of Good Hope and Horn, in the full blaze of light, are inexpressibly tremendous. The soul stands aghast at sight of the indications of tranquillity converted into those of storm; the unclouded azure in the heavens, and the rainbow playing upon the waves. The principles of harmony appear to be completely inverted. Nature seems to have put on a character of perfidiousness, and to conceal fury under the mask of benevolence.

If Nature, by introducing certain agreeable harmonies into scenes of discord, redoubles their confusion, she frequently throws in a discordance in concerts the most delightful, for the purpose of heightening the pleasurable effect. She employs offensive contrasts only to chase man from some perilous situation. In all the rest of her works she employs only harmonic mediums.

In our harvest fields we find that charming shade of green, produced by the alliance of the two primordial opposite colours, the yellow and the blue. This harmonic colour decomposes itself by another metamorphosis, toward the harvest time,

into the three primordial colours, namely, the yellow of the ripening corn, the red of the wild poppy, and the azure of the bluebottle. These two plants are intermingled with the standing corn, all over Europe, let the farmer take what pains he may in sifting the grain and weeding his field. They form, by their harmony, a rich purple tint, which rises admirably on the yellow ground of the corn-field.

The corn-plant itself has relations innumerable with the wants of man and domestic animals. It is neither too high nor too low for his stature, but is easily handled and reaped. It furnishes grain to his poultry, bran to his pigs, forage and litter to his black cattle and horses. Every plant in his corn-field possesses virtues particularly adapted to the maladies incident to the condition of the labouring man. The poppy cures the pleurisy, procures sleep, stops hemorrhages and spitting of blood. The bluebottle is diuretic, vulnerary, cordial, and cooling, an antidote to the stings of venomous insects, and a remedy for inflammation of the eyes. Thus the husbandman finds all needful pharmacy in the field which he cultivates.-]

The culture of this staff of life discloses to man many other agreeable concerts with his fleeting existence. The direction of its shadow informs him of the hour of the day ; from its growth he learns the rapid flight of the seasons ; he reckons the flux of his own fugitive years, by the succession of the guiltless harvests he has reaped. He is haunted with no apprehension, like the inhabitants of great cities, of conjugal infidelity, or a too numerous posterity. His labours are always surpassed by the benefits of Nature. When the sun gets to the sign of Virgo, he summons his kindred, invites his neighbours, and leads them, at dawn of day, with sickle in hand, to the ripened field. His heart exults with joy as he binds up the swelling sheaves, while his children dance around him, crowned with garlands of bluebottles and wild poppies. The harmless play recalls to his memory the amusements of his own early days, and of his virtuous ancestors, whom he hopes at length to rejoin in a better and happier world. The sight of his copious harvest demonstrates that there is a God ; and every return of that joyous season, bringing to his recollection the delicious eras of his past existence, inspires him with gratitude to the Great Being who

has united the transient society of men by an eternal chain of blessings.

× Ye flowery meadows, ye majestic, murmuring forests, ye mossy fountains, ye desert rocks, frequented by the dove alone, ye enchanting solitudes, which charm by your ineffable concerts ; happy is the man who shall be permitted to unveil your hidden beauties ! but happier far is he who shall have it in his power calmly to enjoy them in the inheritance of his forefathers !

OF SOME OTHER LAWS OF NATURE, HITHERTO
IMPERFECTLY KNOWN.

There are, besides those which have been mentioned, some physical laws not hitherto profoundly investigated, though we have had a glimmering of them, and made them the frequent subject of conversation. Such is the law of attraction. It has been acknowledged in the planets, and in some metals, as in iron and the loadstone, in gold and mercury. I believe attraction to be common to all metals, and even fossils ; but that it acts in each in particular circumstances, not yet ascertained. Each of the metals, perhaps, may incline toward different points of the earth, as magnetic iron does to the north. It would probably be necessary to ascertain this by experiment, that each metal should be armed with its proper attraction ; which takes place when united to its contrary.

How do we know whether a needle of gold, rubbed with mercury, might not have attractive poles, as a needle of steel has when rubbed with the magnet ? Thus prepared, it might possibly indicate the places which contain mines of that rich metal. Perhaps it might determine the general points of direction to the east or west, which might indicate the longitudes more steadily than the variations of the magnetic needle.

If there be a point at the pole, on which the globe revolves, there may possibly be one under the equator, from which commenced, and which may have determined, its motion of rotation. It is, however, certain there exist many of those particular points of attraction, scattered over the earth, such as the matrices which renovate the mines of metals, by attracting to themselves the metallic parts dispersed in the elements. Metals have besides other attractions ; and I consider these as the principal matrices of all fossil bodies, and as

the ever active means employed by Nature for repairing the mountains and rocks, which the action of the other elements, but especially the injudicious labours of men, have an incessant tendency to impair.

I shall here remark, on the subject of mines of gold, that they are placed, as well as those of all metals, not only on the most elevated part of continents, but in icy mountains. The gold mines of Peru and Chili are situated in the Cordilleras; those of Mexico in the vicinity of Mount St. Martha, covered with snow all the year round. It may be said that all rivers which wash down particles of gold along their shores, issue from icy mountains.

To this it may be objected, that gold was formerly found in Europe, in places where there were no icy mountains; nay, that some has been picked up on the surface of the ground, as in Brazil. But, if I might venture to hazard a conjecture respecting the origin of this gold, I believe it to have proceeded from the total effusion of the ices of the mountains at the time of the deluge, when vegetable earths and minerals were forced along other countries, where their fragments were found, in the earlier ages, in grains, and even in larger masses.

It would appear as if Nature, by burying the foci of this rich metal under the snows, had intended to fence it with ramparts still more inaccessible than the flinty bosom of the rock, lest the undismayed ardour of human avarice should at length destroy them entirely. It has become the most powerful bond of society, the perpetual object of a life so rapidly hurrying to a close. Alas! were Nature to inflict condign punishment on this insatiable thirst in the nations of Europe, for a metal so useless as a real necessary of human life, she has only to change the territory of some one of them into gold. Every other nation would instantly flock thither, and soon exterminate its wretched inhabitants. The Peruvians and Mexicans have had the dreadful experience of this.

There are metals not so highly prized, but much more useful. The peaks and crests of the mountains are filled with iron or copper, intermingled with a vitreous body of granite or of natural crystal, which attracts the rains and stormy clouds. Seamen have seen, a thousand times, those peaks and crests covered with a cloudy cap concealing them from view, without once suspecting the cause of this appear-

ance ; and philosophers, deducing their conclusions from charts, have taken those rocky protuberances for wrecks of a primitive earth, without troubling themselves about their effects. They ought to have observed that those metallic pyramids and crests, as well as most mines of iron and copper, are to be found in elevated situations, and at the source of rivers, of which they are the primitive causes by their attractions. Their general inattention to this subject is thus only to be accounted for ; seamen observe, and do not reason ; and the learned reason, but do not observe. Undoubtedly, had the experience of the one been united to the sagacity of the other, prodigies of discovery might have been expected.

I am persuaded we might acquire the art of forming, by electric stones, artificial fountains, which should attract the rainy clouds in dry situations, as chains and rods of iron attract thunder-clouds. It is true princes must be at the expense of such costly and useful experiments ; but they would immortalize their memory. The Pharaohs, who built the pyramids of Egypt, would not have drawn upon themselves the curses of their subjects, as Pliny assures us they did, for their enormous and useless labours, had they reared, amidst the sands of Upper Egypt, an electrical pyramid, which might there have formed an artificial fountain. The Arab who should resort thither at this day to quench his thirst, would still pronounce benedictions on names which, if we may believe the great Natural Historian, had already sunk into oblivion, and ceased to be mentioned in his time.

For my own part, I think that several metals might be proper for producing similar effects. A Prussian officer of rank informed me that having remarked vapours to be attracted by lead, he had employed it for drying the atmosphere of a powder-magazine, constructed under ground, in the throat of a bastion, but useless from its humidity. He ordered the concave ceiling of the arch to be lined with lead, where the gunpowder was deposited in barrels ; the vapours of the vault collected in great drops, on the leaden roof, run off in streamlets along the sides, and left the gunpowder barrels perfectly dry.

There are many other harmonic laws as yet undiscovered ; as the proportions of magnitudes, and durations of existence, of beings vegetative and sensible, which differ exceedingly, though their nutriment and climates may be the same. Man,

while yet a youth, sees his dog die of old age ; and also the sheep he fondled when a lamb. Though the former lived at his own table, and the latter on the herbage of his meadow, neither the fidelity of the one, nor the temperance of the other, could prolong their days ; whereas animals which live only on carrion and garbage live for ages, as the crow. In such researches we must follow the spirit of conformity, the basis of our own, and of the reason of Nature.

✓ By consulting this we shall find, that if such a carnivorous animal, the crow for instance, is long-lived, it is because his services and experience are long necessary for purifying the earth. If an innocent animal lives but a little while, it is because his flesh and skin are necessary to man. If the domestic dog, by his death, diffuses sorrow over the children of the family, Nature undoubtedly intended to give them, in the loss of an animal so worthy the affections and regret of man, the first experience of the privations with which human life is to be exercised.

The duration of an animal's life is sometimes proportioned to that of the vegetable on which it feeds. A multitude of caterpillars are born and die with the leaves by which their transitory existence is supported. There are insects whose being is limited to five hours ; such is the ephemera. But as Nature has made nothing in vain, it is not credible that she should have created momentary lives, and beings infinitely minute, to fill up imaginary chains of existence.

The aversions and instincts of animals emanate from laws of a superior order, into which we shall never be able to penetrate ; but supposing those intimate conformities to elude our researches, they must be referred to the general conformity of beings, and especially to that of man. There is nothing so luminous in the study of Nature, as to refer every thing that exists to the goodness of God, and to the demands of humanity. This method of viewing objects not only discovers to us a multitude of unknown laws, but it sets bounds to those we do know, and believe to be universal.

If Nature were governed by the laws of attraction only, every thing would be in a state of rest. Bodies, tending toward one common centre, would there accumulate, and arrange themselves round it in the ratio of their gravity. The substances which compose the globe would be so much heavier as they approached the centre, and those at the sur-

face would all be reduced to a level. The bason of the seas would be choked with the wrecks of the land ; and this magnificent architecture, formed of harmonies so various, would soon become an aquatic globe entirely. All bodies, hurled downward by one common precipitation, would be condemned to an everlasting immobility.

On the other hand, if the law of projection employed for explaining the motions of the heavenly bodies, on the supposition of their tendency to fly off in the tangent of a curve ; if, I say, this law predominated, all bodies not actually adherent to the earth would be hurled from it, like stones from a sling : our globe itself, subjected to this law, would fly off from the sun never to return. It would sometimes traverse the spaces of immensity, where no star would be perceptible for many ages ; sometimes, swinging through regions where chance might have collected the matrices of creation, it might pass along amidst the elementary parts of suns, aggregated by the central laws of attraction, or scattered about in sparks and rays, by those of projection.

But supposing these two contrary forces combined happily enough in favour of the globe, to fix it, with its vortex, in a corner of the firmament, where they should act without destroying themselves, it would present its equator to the sun as regularly as it describes its annual course round him. From those two constant motions never could be produced that other motion so varied, by which it daily inclines one of its poles toward the sun, till its axis has formed, on the plane of its annual circle, an angle of twenty-three degrees and a half ; then that other retrograde motion, by which it presents to him, with equal regularity, the opposite pole. Far from presenting to him alternately its poles, in order that his fertilizing heat may by turns melt their ices, it would retain them buried in eternal night and winter, with a part of the temperate zones, whereas the rest of its circumference would be burned up by the too constant fires of the tropics.

But if we suppose a third variable law, which gives to the earth the movement that produces the seasons, and a fourth, which gives it the diurnal motion of rotation round itself ; and that no one of these laws, so opposite, should ever surpass the others, and, at least, determine it to obey but one single impulsion ; it would be impossible to affirm they had determined the forms and movements of the bodies on its

surface. First, the force of projection, or centrifugal, would not have left upon it any one detached body. On the other hand, the force of attraction, or gravity, would not have permitted the mountains to rise, and still less the metals, the heaviest part of them, to be placed at their summits, where they are usually found.

Vegetables themselves, entirely subjected to the action of the elements, have configurations diversified without end. But how comes it that animals have the principles of so many motions, so entirely different? Wherefore has not gravity nailed them down to the surface of the earth? They ought to crawl along it at most. How comes it to pass, that the laws which regulate the course of the stars, those laws whose influence has, in modern times, been made to extend even to the operations of the human soul, should permit the birds to rise into the air and fly as they please, notwithstanding the united powers of the attraction and projection of the globe?

It is conformity, adaptation to use, which has regulated those laws, and generalized or suspended their effects subordinate to the necessities of sensible beings. Though Nature employs an infinity of means, she permits man to know only the end she has in view. Her works are subjected to rapid dissolutions; but she always suffers him to perceive the immortal consistency of her plans. It is on this she wishes to fix his heart and mind. She aims not at rendering man ingenious and proud, but good and happy. She universally mitigates necessary evils; and multiplies blessings often superfluous. In her harmonies, formed of contraries, she has opposed the empire of death to life; but life endures for an age, death only an instant. She allows man to enjoy the expansions of beings, so delightful to behold; but conceals from him, with a precaution truly maternal, their transient state of dissolution.

If an animal dies, if plants are decomposed in a morass, putrid emanations, and reptiles of a disgusting form, chase us away from them. An infinite number of secondary beings are created for the purpose of hastening forward the decompositions. If cavernous mountains and rocks present appearances of ruin; owls, birds of prey, and ferocious animals, keep us at a distance. Nature drives far from us the spectacles and the ministers of destruction, and allures us to her harmonies.

From a profusion of this unbounded benevolence of Nature, the action of the sun is multiplied wherever it was most necessary, and mitigated where it might have been hurtful. When the orb of day has left us, the moon appears to reflect his light, with varieties in her phases which have relations, hitherto unknown, to a great number of species of animals, and especially of fishes, which travel only in the night-time, at the epochas which she indicates to them. The farther the sun withdraws from one pole, the more are his rays refracted there ; but when he has entirely abandoned it, then his light is supplied in a most wonderful manner. First, the moon, by a movement altogether incomprehensible, replaces him there, and appears perpetually above the horizon, as was observed in 1596, at Nova Zembla, by the unfortunate Dutchmen who wintered there, in the 76th degree of north latitude.

In those dreadful climates Nature multiplies her resources, to bestow on sensible beings, and even on animals, the benefits of light and heat. When the season returns, the sun reappears there before his natural term, as the Dutch mariners saw him to their astonishment above the horizon of Nova Zembla, on the 24th of January, fifteen days sooner than they expected him. This return, so much earlier than their hopes, filled them with joy, and disconcerted the calculations of their intelligent pilot, the unfortunate Barents.

Naturalists consider colours as accidents. But if we attend to the general uses for which Nature employs them, we shall be persuaded there is not, even on rocks, a single shade impressed without a meaning and a purpose. Let us observe the principal effects of the two extreme colours, white and black, with relation to the light. Of all colours, white best reflects the rays of the sun, because it sends them back without any tint, as pure as it receives them ; black, on the contrary, is the least adapted to their reflection, because it absorbs them. Hence gardeners whiten the walls against which their espaliers are planted, to accelerate the maturity of their fruits, by the reverberation of the sun's rays ; and opticians blacken the walls of the *camera-obscura*, that their reflexes may not disturb the luminous picture on the tablet.

Nature frequently employs contrary means for producing the same effect. She makes glass with fire ; she makes it too with water, crystal for instance : farther, she produces it from animal organization, such as certain transparent shell-

fish. She forms the diamond by a process to us utterly unknown. Conclude now, because a body has been vitrified, it must certainly be by the effect of fire, and rear on this perception the system of the universe ! The utmost that we can do is to catch some harmonic instants in the existence of beings. That which is vitrifiable becomes calcareous, and what is calcareous changes into glass, by the action of the same fire. Deduce, then, from these simple modifications of the fossil kingdom, invariable characters for determining the general classes of it !

On the other hand, Nature frequently employs the same means for producing effects directly contrary. For example, to increase the heat over the lands of the north, and to mitigate it over those of the south, she makes use of opposite colours ; she produces in both the same effects, by covering the face of both with rocks. These rocks are essentially necessary to vegetation.

× Nature proposes to herself, universally, only the accommodation of beings possessed of sensibility. This remark is all-important in the study of her works ; otherwise, from the similitude which she employs, or the exceptions from them, we might be tempted to doubt of the consistency of her laws, instead of ascribing the majestic obscurity which pervades them to the multiplicity of her resources, and to the profundity of our own ignorance.

This law of adaptation and conformity has been the source of all our discoveries. It was this which wafted Columbus to America ; because, as Herrera tells us,* he thought, contrary to the opinion of the ancients, that the whole five zones must be inhabited, as God had not formed the earth to be a desert. This law regulates our ideas respecting objects absolutely beyond the reach of our examination. By means of it, though ignorant whether there may be men in the planets, we are assured there must be eyes, because there is light. It has awakened a sense of justice in the heart of every man, informing him there is another order of things after this life. (This law, in a word, is the most irresistible proof of the existence of God ; for amidst such a multitude of adaptations, so ingenious and so numerous, that every day is presenting some with all the merit of novelty, the first of all,

* Herrera's History of the West-Indies, book i. chap. 2.

which is the DEITY, must undoubtedly exist, as he is the general conformity of all particular conformities.]

How often, on coming out of the King's magnificent Cabinet of Natural History, do we stop mechanically to look at a gardener digging a hole in the field, or a carpenter hewing a piece of timber! It looks as if we expected some new harmony to start out of the bosom of the earth, or burst from the side of a lump of oak. We set no value on those we have just been enjoying, unless they lead us forward to others we do not know as yet. But were the complete history given us of the stars of the firmament, and the invisible planets which encircle them, we should perceive a multitude of ineffable plans of intelligence and goodness, after which the heart would continue fondly to sigh: its last and only end is the DIVINITY himself.

STUDY ELEVENTH.

APPLICATION OF SOME GENERAL LAWS OF NATURE TO PLANTS.

BEFORE I proceed to speak of plants, I must be indulged in making a few reflections on the language of botany.

We are still so young in the study of Nature, that our languages are deficient in terms to express her most common harmonies. This is so true, that however exact the description of plants may be, and compiled by botanists of whatever ability, it is impossible to distinguish them in the fields, unless you have previously seen them in Nature, or at least in a herbarium. Men of genius have taken inexpressible pains to assign characteristic names to the different parts of plants, and have even borrowed most of those names from the Greek, a language of singular energy of expression. Those names being mostly compounds, cannot be rendered into modern language; hence a great part of the works of Linnæus are absolutely incapable of translation. These learned and mysterious expressions, no doubt, diffuse a venerable air over the study of botany: but Nature has no need of such resources of human art to attract our respect.

Most of those foreign names, employed particularly by the

herd of botanists, do not so much as express the most common characters of vegetables. They frequently make use, for example, of such vague expressions as these, *suave rubente*, *suave olente*, of an agreeable red, sweet-smelling, to characterize flowers; without expressing the shade of red, or the species of perfume. They are still more embarrassed to convey the dusky colours of the stem, root, or fruit: *atro-rubente*, say they, *fusco-nigrescente*, of a dark red, of a dusky brown. As to the forms of vegetables, the case is still worse, though they have fabricated terms compounded of four or five Greek words to describe them.

J. J. Rousseau communicated to me, one day, a set of characters somewhat resembling the algebraic, which he had invented briefly to express the colours and forms of vegetables. Some represented the forms of the flowers; others of the leaves; others of the fruits. Some resembled a heart, some were triangular, some of the lozenge shape. He did not employ above nine or ten signs to compose the expression of one plant. Some he placed above others, with ciphers indicating the genera and species of the plant, so that you would have taken them for the terms of an algebraic formula. However ingenious and expeditious this method might be, he informed me he had given it up, because it presented skeletons only.

This sentiment came with peculiar grace from a man whose taste was equal to his genius, and may suggest some reflections to those who are for abridging every thing, especially the works of Nature. The idea of John-James, however, well deserves to be followed up, should it only serve to produce, one day, an alphabet proper to express the language of Nature.

Though we have only the term *white*, to express the colour of that name, Nature presents to us many sorts of it. Painting, with respect to this article, is as barren as language.

A painter of Italy found himself much embarrassed how to represent three figures dressed in white. The point in question was, to give effect to those figures, to be thus uniformly dressed, and to draw out different shades of the most simple of all colours. He was going to abandon his object as impossible, when, passing through a corn-market, he perceived the effect he was in quest of. It was a group formed by three millers, one under a tree, the second in the half tint

of the shade of that tree, and the third exposed to the rays of the sun : so that though the drapery of all three was white, they were completely detached from each other. He introduced a tree, therefore, amidst the three personages of his picture, and by illuminating one of them with the rays of the sun, and throwing over the other two different tints of shade, he was enabled to exhibit a drapery of three several casts of white.

Naturalists are much embarrassed to find distinctive epithets for dusky colours ; they, however, evade the difficulty by the vague expressions of blackish, gray, ash-coloured, brown, conveyed, it is true, in Greek and Latin words : but those words frequently confound their images, by giving no representation whatever ; for what, in good earnest, is meant by these, and such like epithets, *atro-purpurante*, *fusco-nigrescente*, which they employ so often ?

It is possible to make thousands of tints widely different, to which such general expressions might be applied. As those dark shades, in truth, are much compounded, it is difficult to characterize them by the phraseology of our common vocabularies. But this might be effectually accomplished, by referring them to the different colours of our domestic vegetables. I have remarked in the barks of trees and shrubbery, in the capsules and shells of their fruits, as well as in the dead leaves, an incredible variety of those sad and gloomy shades, from yellow down to black, with all the intermixtures and accidents of the other colours. Thus, instead of saying in Latin, a yellow inclining to black, or an ash-coloured tint, in order to determine some particular shade of colour in a production of Art, or of Nature, we might say a yellow of the colour of a dried walnut, or a gray like the bark of a beech tree.

Those expressions would be the more exact, that Nature invariably employs such tints in vegetables, as determining characters and indications of maturity, vigour, or decay ; and our peasantry can tell the different species of wood in the forests by the bark simply. Thus, not botany alone, but all the arts, might find in vegetables an inexhaustible dictionary of unvarying colours, unembarrassed with barbarous and technical compound words, but which would continually present new images. Our books of science would thence derive much pleasing vivacity, from being embellished by compari-

sons and expressions borrowed from the loveliest kingdom of Nature. The great poets of antiquity carefully availed themselves of this, by referring most of the events of human life to some appearance of the vegetable kingdom.

An approximation of savours and smells of every species and country, to those of the plants of our gardens and fields, may likewise be traced. The ranunculus of the meadow has the acridity of the Java pepper; the root of the holy-thistle, and the flower of the pink, smell like the clove of Amboyna. As to compound savours and smells, they may be referred to such as are simple, the elements of which Nature has scattered over all climates, and united in the class of vegetables. I know a species of morel, used as food by the Indians, which when boiled has the taste of beef. They call it *brette*. There is a species of the crane's-bill, the leaf of which resembles in smell a roasted leg of mutton. The muscari, a species of small hyacinth, which grows among shrubbery early in the spring, smells very strongly of the plum. Its small monopetalous flowers, of a delicate blue colour, and with lips or incisions, have likewise the form of that fruit.

By such approximations Dampier and Father du Tertre have formed the most accurate notions of the fruits and flowers which grow between the tropics, by referring them to those of our own climates; giving, by means of trivial similitudes, a precise idea of a foreign vegetable, which you would search for to no purpose in the Greek names of our first-rate botanists.

These approximations of plants farther present us with the combined whole of an unknown object, without which we can form no determinate idea of it. One defect of botany is, it exhibits the characters of vegetables only in succession; it does not collect, but decomposes them. It refers them indeed to a classical, but not an individual order, the only one the human mind permits us to catch. [We love order, because we are feeble, and there is no order we can so easily adopt as that which Nature is everywhere presenting.

It would therefore be important to have, in botany, an alphabet of colours, savours, smells, forms, and aggregations, derived from our most common plants. Those elementary characters would enable us to express ourselves exactly in

all the parts of natural history, and to present to ourselves relations equally new and curious.

When we see a multitude of plants, of different forms, vegetate on the same soil, there is a disposition to believe that those of the same climate grow indifferently everywhere. But those only which are produced in places particularly assigned to them by Nature, attain there all the perfection of which they are susceptible. The same thing holds good with respect to animals.

If we throw a simple glance on plants, we shall perceive they have relations to the elements which promote their growth : to each other, from the groups they contribute to form ; to the animals whom they nourish ; and finally, to man, the centre of all the works of creation. To these relations I give the name of harmonies, and I divide them into elementary, vegetable, animal, and human.

We shall make application of the laws previously established, and take a glimpse of many others, equally worthy of research, and calculated to excite admiration. Reader, be not astonished at their number or extent. Let this great truth be deeply impressed on thy heart : *God has made nothing in vain !* A scholar, with his systems and methods, finds himself stopped short in Nature every step he takes ; while, furnished with this as a key, the ignorant rustic is able to unlock every door of knowledge.

ELEMENTARY HARMONIES OF PLANTS.

Plants have as many principal parts as there are elements with which they keep up a relation. By their flowers, they stand related to the sun, which fecundates their seeds, and carries them on to maturity ; by their leaves, they are related to the waters, which bedew them ; by their stems, to the winds which agitate them ; by their roots, with the ground which sustains them ; and by their grains, with their situations adapted to their growth and increase. Not that these principal parts have no indirect relations besides to the other elements, but it will be sufficient for our purpose to dwell on such as are immediate.

Elementary Harmonies of Plants with the Sun, by the Flowers.

Though botanists may have made great and laborious researches respecting plants, they have paid no attention to

any of those relations. Fettered by their systems, they have only considered them on the side of the flowers ; and arranged them in the same class, wherever they found these external resemblances, without even inquiring the particular use of the florification. They have, indeed, distinguished in it the stamina, the antheræ, and the stigmata, for the fecundation of the fruit ; but, excepting this, and some others respecting the interior organization, they have neglected, or misunderstood, the relations the whole plant has with the rest of Nature.

This partial division has led them into the strangest confusion ; for, by considering the flowers as the principal characters of vegetation, and by comprehending in the same class those which were similar, they have united plants entirely foreign to each other, and have separated, on the contrary, many evidently of the same genus. Such is, in the first case, the fuller's-thistle, called *dipsacus*, which they class with the scabious, because of the resemblance of some parts of its flower ; though it presents in its branches, leaves, smell, seed, prickles, and the rest of its qualities, a real thistle : and such is, in the second, the great chesnut of India, excluded from the class of chesnut-trees, because it has different flowers. To class plants from the flowers, that is, from the parts of their fecundation, is the same thing with classing animals from those of generation.

Though they have referred the character of a plant to its flower, they misunderstood the use of its most shining part, that of the corolla. They call that the corolla, which is, in common language, denominated the leaves of a flower. It is a Latin word, signifying a little crown, from the disposition of the leaves, in many species, in the form of coronets ; and they have given the name of petals to the divisions of that crown. Some, in truth, have acknowledged it to be properly adapted for covering the parts of fecundation before the expansion of the flower ; but its calix is much better adapted to this purpose, from its thickness, beards, and sometimes the prickles with which it is invested. Besides, when the corolla leaves the stamina exposed, and when it continues fully blown for whole weeks, it must of necessity be answering some other purpose ; for Nature does nothing in vain.

The corolla seems intended to reverberate the rays of the sun on the parts of fecundation ; and we shall not doubt this, if we consider the colour and form of it in most flowers.

Their corollæ, divided into petals, are only an assemblage of mirrors directed towards one focus. Of these they have sometimes four, which are plain, as the flower of the colewort in the cruciform ; or a complete circle, as the daisy in the class radiated ; or spherical portions, as the rose ; or entire spheres, as the bells of the lily of the valley ; or cones mutilated, as the foxglove, the corolla of which is formed like a sewing thimble. Nature has placed at the foci of these, plain, spherical, elliptical, parabolic, and other mirrors, the parts of the fecundation of plants, as she has placed those of generation in animals in the warmest parts of their bodies.

The petals appear to such a degree destined to warm the parts of fecundation, that Nature has placed a circle of them around most compound flowers, themselves aggregations of many small tubes, that form so many particular flowrets. This is obviously remarkable in the petals which surround the disks of daisies and sun-flowers.

Nature has still other means of multiplying the reflexes of heat in flowers. Sometimes she places them on stems of no great elevation, to collect warmth from the reflections of the earth ; sometimes she glares over their corollæ with a shining varnish, as the yellow meadow-ranunculus, or butter-flower. Sometimes she withdraws the corolla, and makes the parts of fecundation shoot from the partition of an ear, of a cone, or of the branch of a tree. There are others, such as most part of the convolvuluses, which expand only in the night.

There are compound flowers, which being in a horizontal position, and completely exposed, behold the sun from his rising to his setting ; as the flower of the dandelion. But it possesses very peculiar means of sheltering itself from the heat : it closes entirely whenever the heat becomes excessive. It has been observed to open in summer at half an hour after five in the morning, and to collect its petals towards the centre about nine o'clock. The flower of the garden-lettuce, on the contrary, in a vertical plane, opens at seven o'clock, and shuts at ten.

From a series of similar observations, Linnæus formed a botanical time-piece ; for he had found plants which opened their flowers at every hour of the day and night. There is cultivated in the king's garden, at Paris, a species of serpentine aloes, without prickles, whose large and beautiful flower exhales a strong odour of the vanilla, during the short time of

its expansion, blows in July, about five o'clock in the evening, when it gradually opens its petals, expands them, fades, and dies. By ten o'clock of the same night, it is totally withered, to the great astonishment of the spectators, who flock in crowds to the sight; for what is uncommon is alone admired. The flower of our common thorn, I do not mean that of the white-thorn, is still more extraordinary; for it flowers so rapidly that there is scarce time to observe its expansion.

These observations, taken in their connexion, clearly demonstrate the relations of the corollæ to the heat of the sun. But if Nature withdraws the greatest number of flowers from the too violent action of the sun, she destines others to appear in the lustre of his rays, without sustaining the least injury from them. On the first she bestows dusky reflectors, or such as can close themselves as occasion requires; she provides others with parasols. But she need not create new parts to communicate new characters to her works; she deduces them at once from existence and non-existence, rendering them positive or negative, at her pleasure. She has given curves to most flowers, for the purpose of collecting the heat at their centre: she employs the same curves, when she thinks proper, in order to dissipate the heat: she places the foci of them so as to act outwardly.

To reverberating flowers, *perpendicular, conical, spherical, elliptical, parabolic, or plane*, may be referred most of the curves of flowers. There are some flowers in form of a parasol, but the others are much more numerous; for the negative effects in every harmony exceed the positive. For example, there is but one way of coming into life, but thousands of going out of it.

PERPENDICULAR reverberating flowers are those which grow adhering by the back to a cone, to long catkins, or to an ear of corn.

CONICAL reverberating flowers reflect on the parts of florification a complete cone of light.

SPHERICAL reverberating flowers are those whose petals are formed into segments of a circle.

ELLIPTICAL reverberating flowers are those which present oval-formed cups, narrower at the top than in the middle.

Flowers with PARABOLIC or PLANE mirrors, are those which reflect the rays of the sun in parallel directions.

To preserve flowers from the shock of the winds upon their

stems, Nature mostly inwraps them in an integument, which botanists call the *calix*. The more ramous the plant, the thicker the calix of its flower. She sometimes fringes it with little cushions and beards, as in the rose-bud. Thus the mother puts a pad round the head of her little child, to secure it against accidents from falling. Nature has so clearly marked her intention as to this, in the flowers of ramous plants, that she has deprived of this clothing such as grow on stems not branchy, and where they are in no danger from the agitation of the winds.

Flowers have, farther, very curious relations with animals and with man, from the diversity of their configurations and their smells. Those of one species of the orchis represent bugs, and exhale their odour ; those of a species of the arum resemble putrid flesh, and have the infection of it to such a degree, that the flesh-fly resorts thither to deposit her eggs. But when botanists shall have diffused over this branch of the subject all the light of which it is susceptible, and consider how Nature compensates the differences of their several exposures, they will no longer doubt those elementary harmonies, but acknowledge that the flower, far from presenting an unvarying character in plants, exhibits a perpetual character of diversity. If there be any constant character in plants we must look for it in the fruit. To this Nature has directed all the parts of vegetation, as to the principal object. That saying of WISDOM itself, *By their fruits ye shall know them*, is at least as applicable to plants as to the human species.

ELEMENTARY HARMONIES OF PLANTS WITH WATER AND AIR, BY MEANS OF THEIR LEAVES AND FRUITS.

When the AUTHOR of Nature designed to clothe with vegetables even the highest and steepest pinnacles of the earth, He first adapted the chains of mountains to the basons of the seas which were to supply them with vapours ; to the course of the winds which were to waft them thither, and to the different aspects of the sun by which they were to be heated. When those harmonies were established between the elements, the clouds ascended out of the ocean, and dispersed themselves over the most remote parts of the continents. There they distilled in fogs, mists, dews, rains, snows, and descended from the heights of the atmosphere, some in a tranquil air, as our spring showers ; others, driven by furious winds,

beat horizontally on the sides of the mountains ; others fell in torrents. There were some accumulated in mountains of snow, on the summits of the Andes, to cool by their effusions the continent of South America, and, by their icy atmosphere, the vast expanse of the Pacific Ocean. In a word, mighty rivers flowed over regions where the rain never descends, and the Nile watered the plains of Egypt.

× Then God said : ‘ Let the earth bring forth grass, the herb yielding seed, and the fruit-tree yielding fruit after his kind, whose seed is in itself upon the earth.’ At the voice of the Almighty, the vegetables appeared with organs perfectly fitted to collect the blessings of Heaven. From the cedar of Lebanon down to the violet which perfumes the grove, there was not one but what presented its large goblet, or its tiny cup, conformably to its necessity or its station.

This adaptation of the leaves of plants in elevated situations, for receiving the descending distillations of the rain, is varied without end ; but the character of it is discernible in most, not only in their concave forms, but likewise in a little canal, scooped out on the pedicle by which they are attached to their branches. It has something of a resemblance to that Nature has traced on the upper lip of man, to receive the humours which descend from the brain. This aqueduct is traced on the pedicle of the smallest leaves of mountain plants ; by means of it Nature has rendered the forms themselves of aquatic plants susceptible of vegetation in the most parched situations.

Many leaves, even of the plants of the plains, assume, on their first springing up, this form of a little furrow, or spoon, as those of the violet, and of most gramineous plants. You may perceive in the spring, the young tufts of these raising themselves upright toward heavens, like paws, to catch the falling drops, especially when it begins to rain ; but most plants of the plains lose their gutter as they expand. It has been bestowed on them only during the season when it was necessary to their growth. It is permanent only in the plants of the mountains. It is traced, as has been mentioned, on the pedicle of the leaves, and conducts the rain-water into the tree from the leaf to the branch ; the branch, by the obliquity of its position, conveys it to the trunk, from whence it descends to the root, by a series of successive dispositions. If you pour water gently over the leaves of a mountain-shrub

which are the farthest from its stem, you will perceive it pursue the progress which I have just indicated, and not a single drop will be lost on the ground.

The bark of most mountain trees is equally adapted for conducting the rain-water from the branches to the roots. That of the pine is in large perpendicular ribs; that of the elm is cleft and chinked longitudinally; that of the cypress is spongy, like the coat of flax. The plants of mountains and dry grounds have a farther character, which is in general peculiar to them; that of attracting the water which floats in the air in imperceptible vapours.

There is not a single vegetable, the leaf of which is disposed to receive the rain-water on the mountains, whose seed is not formed in a manner the best adapted to raise itself thither. The seeds of all mountain plants are volatile. Those which appear too heavy for flying, are furnished with other resources. The peas of the balsamine have pods whose elasticity darts them to a considerable distance. Those which have neither tufts, pinions, nor springs, and from their weight seem condemned to remain at the foot of the vegetable which produced them, often travel the farthest. Multitudes of berries and shell-fruits resow themselves; their seeds are enclosed in stony incrustations, not capable of being digested; they are swallowed by the birds, who carry them off, and plant them in the cornices of towers, in the clefts of rocks, on the trunks of trees, beyond rivers, nay beyond oceans. Thus a bird of the Moluccas repeopled with the nutmeg plant the desert islands of that archipelago, in defiance of all the efforts of the Dutch, who destroy those trees in every place where they cannot be subservient to their own commerce.

On the relations between vegetables and animals, it is sufficient to observe, that most birds resow the vegetable which feeds them. Nay, we find quadrupeds which convey to a great distance the seeds of the grasses. Horses, who do not chew the cud, and whose dung is hurtful to the meadows, for an obvious reason, introduce into them a variety of foreign herbs, as the heath and short furze, the seeds of which they are unable to digest. They resow, besides, many others, which adhere to their hair, by the motion of their tail simply. There are quadrupeds of small size, as the dormouse, hedgehog, and marmot, which convey to the most elevated regions of the mountains, acorns, beech-mast, and chesnuts.

It is singularly worthy of remark, that volatile seeds are produced in much greater number than those of other species; and in this we are called upon to admire the intelligence of that Providence which foresaw and arranged every thing accordingly. The elevated situations for which they are destined, were exposed to be speedily stripped of their vegetables, by the declivity of their soil, and by the rains, which have a continual tendency to lower them. By means of the volatility of grains, they are become of all the places of the earth the most prolific in plants. In the mountains is deposited the botanist's treasure.

It cannot be too frequently repeated, The remedies provided by Nature always surmount the obstacles she has opposed; and her compensations ever exceed her gifts. In truth, if you except the inconveniences of declivity, a mountain presents to plants the greatest variety of exposures. In a plain they have the same sun, humidity, soil, and wind; but every step we take upon a mountain, whether ascending or descending, gives us a change of latitude; and if we encompass it round and round, of longitude.

We must proceed farther to observe, and who can do it without profound admiration, that the season of the maturity of volatile seeds takes place towards the commencement of autumn; and that from an effect of the universal Intelligence, which constrains all the parts of Nature to act in concert. Then it is we have the most violent gales of wind, called the equinoctial winds, which blow in all parts of the continents, from the bosom of the seas to the mountains, in correspondence with them. Not only do they convey thither the volatile grains, then in a state of maturity, but likewise blend with these thick clouds of dust carried off from lands dried up by the burning heats of summer, and particularly from the shores of the sea.

Those emanations of dust are so copious, that I could produce many instances of vessels covered with them, as they were crossing gulfs, more than six leagues distant from land. They are so troublesome in the loftier provinces of Asia, that all travellers who have visited Pekin assure us it is impossible to walk the streets of that city, for a considerable part of the year, without having the face veiled. Thus there are rains of dust, which repair the summits of the mountains, as there are rains of water which feed their sources. Both

the one and the other issue from the sea, and return to it by the course of the rivers, which are perpetually conveying thither their tribute of waters and sands. The maritime winds unite their efforts towards the autumnal equinox, transport from the circumference of the continents, to mountains the most remote from them, the seeds and the manure which had flowed from thence, and sow meadows, groves, and forests, on the sides of precipices, and on the most inaccessible peaks. Thus the leaves, the stems, the seeds, the birds, the seasons, the seas, and the winds, concur, in a most wonderful manner, to keep up the vegetation of the mountains.

I shall add, on this subject, that so far are mountains from being the productions of a centrifugal force, of fire, of earthquakes, or water-courses, that I know of at least ten different species, which have a configuration perfectly adapted for keeping up, in every particular latitude, the harmony of the elements relatively to vegetation. Each has vegetables and quadrupeds peculiar to itself, and nowhere else to be found. This proves they are not the work of chance. Finally, among that inconceivable number of mountains which cover the greatest part of the five zones, and especially the torrid and icy zones, there is but one single species, the least considerable of all, which presents to the water-courses projecting and retreating angles in correspondence. This however is no more their work than the bason of the seas is itself the work of the ocean.

With respect to the harmony of aquatic plants, they have dispositions entirely different in their leaves, the bearing of their branches, and, above all, in the configuration of their seeds. Nature, to vary her harmonies, only employs positive and negative characters. She has bestowed an aqueduct on the pedicle of the leaves of mountain plants; she withdraws it from those which grow by the side of the waters, and transforms them into aquatic plants. These, instead of having their leaves hollowed out into gutters, are clothed with leaves smooth and sleek, such as the corn-flag, which bears them in the form of a poniard's blade, or swelling in the middle like a sword blade, as those of the species of reed called typha, that common sort, the stem of which the Jews put into the hand of JESUS CHRIST.

If the leaves of mountain plants are constructed for collecting at their roots the waters of heaven, which they have

not always at command; that of aquatic plants are frequently disposed in such a manner as to remove them, because they are destined to grow in the bosom of water, or in its vicinity. The leaves of trees which love the water's side, as the birch, aspen, and poplar, are attached to long and pendent tails; but those which grow entirely under the shade of trees, and have scarcely any roots, as mushrooms, have leaves that so far from pointing toward heaven are turned downward to the earth. There are many numerous species lined with tubes, others are stuffed with sponges; some whose pedicle is hollow inwardly, and bearing a chapiter at the top, there collect the emanations of their soil as in an alembic. Thus there is not a particle of vapour in the universe goes to waste.

It is necessary carefully to make a distinction between the elementary and the relative characters of plants. Nature obliges the man who studies her not to hold to external appearances, and in order to form his understanding, she makes him rise from the means which she employs, to the ends she proposes.

We may certainly deduce this conclusion in favour of our improvements in culture, that in the cultivation of plants, the pedicle of whose leaves presents no impress of a canal, it is necessary to water them copiously; for in this case they are naturally aquatic. The nasturtium, mint, and sweet-marjoram, consume a prodigious quantity. But when plants are provided with a canal, they must be watered more sparingly, for this demonstrates them to be originally natives of the mountains. The deeper this canal is, the less artificial watering do they require. Every gardener knows that if you frequently water the aloes, or the taper of Peru, you kill them.

The seeds of aquatic plants have forms not less adapted than those of their leaves, to the places where they are destined to grow; they are all constructed in a manner the most proper for sailing off. Some of them are fashioned into the figure of shells, others into boats, rafts, skiffs, single and double canoes, similar to those of the South Seas. I can have no doubt that by an attentive study of this part alone, a great number of very curious discoveries might be made, respecting the art of crossing currents of every sort; and I am persuaded that the first men, who were much better

observers than we are, copied their different methods of travelling by water, after those models of Nature, of which we with all our pretensions to discovery are but feeble imitators

If the leaves, stems, attitudes, and seeds of aquatic plants are judiciously examined, they will be found in perfect harmony with each other. The natability of their seed is, undoubtedly, proportioned to the length of the voyages they have to perform, and the gravity of the waters in which they are to swim. Some float in sea-water and sink in fresh, lighter than sea-water by one thirty-second part: such precision is in the balancing of Nature! In a word, I am so convinced of all the relations Nature has established among her works, as to conclude, that the time when the seeds of aquatic plants drop, is regulated, in most cases, by that of the overflowing of the rivers where they grow.

It is a speculation well worthy the attention of the philosophic mind, to trace those vegetable fleets sailing night and day with the current of the rivulets, and arriving, undirected by any pilot, on unknown regions. Some, by the overflowing of the water, now and then lose themselves in the plains. I have seen them sometimes accumulated upon each other, in the bed of torrents, presenting around the pebbles where they had germinated, waves of verdure of the most beautiful sea-green. Others cross the vast ocean, and are driven by the very tempests on the regions they adorn and enrich. Such are the double cocoas of the Sechelles, or Mahe Islands, which the sea carries 400 leagues every year, and lands them on the coast of Malabar. The Indians long believed those annual presents of the ocean must have been the produce of palm-trees that grew under its billows. They called them marine cocoa-nuts, ascribed wonderful virtues to them, and set so high a value upon them, that many have been sold for a thousand crowns a-piece. But the French having discovered the island of Mahe, which produces them, imported such quantities to India, that they sunk at once in value and reputation; for men in every country prize those things only which are rare and mysterious.

In every island where the eye of the traveller has been able to contemplate the primordial dispositions of Nature, he has found their shores covered with vegetables, all the fruits of which possess nautical characters. By the course of those nautical seeds, too carelessly observed by modern seamen,

the savages formerly discovered the islands to windward of the countries they inhabited. They formed conjectures respecting a tree at a great distance, on seeing its fruit cast upon their shores. By similar indications Christopher Columbus acquired the assurance that another world existed.

There are, besides, vegetables of an amphibious nature, so disposed that one part of their foliage raises itself towards heaven, while the other bends downwards to the ground. Nature has given to their seeds the power of at once flying and swimming. Such is the willow, the seed of which is enveloped in a cobweb down, which the winds transport to a great distance, and which floats along the surface of the water without wetting itself, like the downy feathers of the duck. The same thing holds as to the seeds of the poplar; but those of the alder, which grows on the banks of rivers, have no plumage, because the current of the stream is designed to convey them from place to place.

This would be the proper place to speak of the roots of vegetables; but I am little acquainted with what passes under ground. I have no doubt, however, that Nature has established, on this subject, relations, the knowledge of which would be highly useful, and that a cultivator, somewhat experienced, might be able, by inspecting the root of a vegetable, to determine the species of soil best adapted to it.

There are trees, whose trunks and roots are admirably contrasted with obstacles which appear to us accidental, but which provident Nature foresaw. The cypress of Louisiana grows with its foot in the water, chiefly on the banks of the Mississippi. Nature has given to the trunk of this stately tree a circumference of more than thirty feet, to enable it to resist the ices from the lakes of the north, which discharge themselves into that river; and to put it beyond a doubt that she designed the thickness of its trunk for withstanding the shock of floating bodies, at the height of six feet she suddenly diminishes its size at least a third, the full magnitude having then become superfluous: and for the better securing it, she raises out of the root at four or five feet distance, all around, several large stumps from one to four feet high. These are not shoots; for their head is smooth, without leaves or branches: they are real ice-breakers.

It must now be apparent of what importance it is to connect the study of plants with that of the other works of

Nature. It is possible to ascertain, by their flowers, the exposure to the sun best adapted to them ; by their leaves, the quantity of water necessary to vegetation ; by their roots, the most suitable soil ; and by their fruits, the situations they ought to be placed in, together with new relations to the animals which feed upon them. By fruit, I mean, as botanists do, seed of every species.

The fruit is the principal character of the plant, from the care Nature has bestowed on its formation and preservation. It is the ultimate term of her productions. If you examine, in a vegetable, the different envelopes which enclose its leaves, flowers, and fruits, you will perceive a wonderful progression of pains and precautions. The simple leaf-buds are easily distinguishable, from the simplicity of their cases. Nay there are plants which have none at all, as the shoots of the gramineous, which start immediately out of the earth, and need no foreign protection. But the buds which contain flowers are provided with sheaths, or lined with down, as those of the apple-tree ; or cased with glue externally, as those of the great India chesnut ; or are enclosed in bags, as the flowers of the narcissus ; or secured in some way or another, so as to be very distinguishable even before their expansion.

You afterward perceive that the care employed in dressing out the flower was entirely destined to the fecundation of the fruit ; and when this is once formed, Nature redoubles her precautions for its preservation. She gives it a placenta, envelopes it in pellicles, shells, pulps, pods, capsules, husks, skins, and sometimes in a case of thorns. A mother cannot pay more attention to the cradle of her infant. In process of time, that her grown child may go abroad and look for a settlement in the world, she crowns it with a tuft of plumage, or encloses it in a shell ; furnishes it with wings to fly through the air, or with a bark to sail along the surface of the water.

To arrest our observation in favour of the fruit, Nature frequently varies the leaves, flowers, stems, and roots of a plant ; but the fruit remains constantly the same, if not in form, at least in its essential substance. I am persuaded that when she was pleased to create a fruit, she gave it the power of reproducing itself on the mountains, in the plains, amidst rocks, in sands, on the brink of waters, and under different

latitudes ; and to adapt it to its situation, she varied the watering pot, mirror, prop, attitude, buttress, and fur of the vegetable, correspondingly to the sun, rains, winds, and soil. To this intention, I believe, we ought to ascribe the prodigious variety of species in every genus, and the beauty each attains in its natural situation. Thus, in forming the chesnut to reach perfection on the stony mountains of the south of Europe, and to supply the want of corn, which scarcely ever succeeds there, she placed it on a tree which in those regions attains magnificence from its adaptations.

I have eaten of the fruit of the chesnut-tree of the island of Corsica, as large as small hen's eggs, and excellent food. Nature has granted to this stately vegetable the faculty of collecting, on the steep mountains, the waters of the atmosphere by leaves formed like so many tongues ; and of penetrating, by its sturdy roots, down to the very bed of fountains, in despite of lavas and rocks. She has been pleased, elsewhere, to produce the fruit of this tree with a degree of bitterness, for the use of some animal, no doubt, on the brink of the salt water creeks and arms of the sea in Virginia. It arrives at much greater beauty in India, its native country, than in Europe. The American is the maritime chesnut-tree ; that of Europe the chesnut-tree of the mountains. She has placed, perhaps by a different kind of combination, this fruit on the beech-tree of our hills, the mast of which is evidently a species of chesnut.

Finally, by means of one of those maternal attentions which have induced her to suspend, even on herbs, the productions of trees, and to serve up the same dishes on the smallest tables, she has placed before us a similar fruit in the grain of the black corn ; at any rate it is certain, that, independent of the mealy substance, we find in the black corn, beech-mast, and chesnut, similar properties, such as that of cooling excessive heat of urine.*

It was in like manner the intention of Nature to produce the acorn in a great variety of exposures. It is of this the poets speak in celebrating the felicity of the Golden Age, because its fruit then served as an aliment to man. Indeed every genus of vegetable gives, in some one of its species, a substance capable of being converted to his use ; and

* See Chomel's Treatise on Common Plants.

× Nature has been pleased, after making this provision for man, to scatter the other species of the oak over the different soils of America, to supply the necessities of her other creatures. She has preserved the fruit, varying only the other parts of the vegetable.

It may be necessary to observe, that the place where any species of plant produces the finest fruit, determines its principal genus. To it, accordingly, Nature has attached the principal relations of the animal kingdom to the vegetable. It was her intention that a mountain animal should find his accustomed fruit in the plains, on the sand, among the rocks, when he is obliged to change his country, and especially on the brinks of rivers, when he descends to quench his thirst. I am not acquainted with a single mountain plant but what has some of its species, with their corresponding varieties, scattered over all situations, but principally on the margin of waters.

× It appears impossible to acquire a knowledge of plants unless by studying their geography and ephemeris. Without this double illumination, which mutually reflects, their forms will be for ever strange to us. Though my observations on the elementary harmonies of plants are but few, I have the confidence to affirm them of high importance to the progress of agriculture. Nature has outrun our wishes where she has been left at liberty to re-establish her own plans. To secure prosperity to ours, we must reduce them into harmony with hers. To ascertain what plants are best adapted for such and such a district, pay attention to the wild plants which thrive there spontaneously, and are distinguishable for their vigour and numbers: then substitute in their place domestic plants with the same kind of flowers and leaves. I am persuaded, by these natural approximations advantage might be derived from the most barren sands and rocks, for there is not a single genus of wild plant but what contains a species fit for food.

× But it was not sufficient for Nature to have established so many harmonies between plants and the vegetative situations, had she not provided means for restoring them, when destroyed by the intolerant culture of man. Let a piece of ground be left uncultivated a short time, and it will presently be clothed with vegetables. They grow in such numbers, and so vigorously, that no husbandman can produce an equal

quantity on the same spot. Nature, who is always advancing from harmony to harmony, till she attains that perfection she proposes to herself, sows, at first, with grasses and herbage of different species, all abandoned soils, waiting for an opportunity of exerting her powers, to raise on that very spot vegetables of a higher order. On the rude neglected districts, where barren downs alone meet our eyes, posterity may behold stately forests arising.

× The principal means employed by Nature, for securing the growth of plants of every other species, are the thorny plants. Plants of this description are the first which appear on lands in fallow, or in forests cut down. They are in truth wonderfully well adapted to promote foreign vegetations, because their boughs leave underneath and around them many intervals, through which other vegetables may arise, and find protection from the tooth of most quadrupeds. Nurseries of trees are frequently found in their bosom. Nothing is more common in coppice woods than to see a young oak start out of a tuft of brambles, which enamels the earth all around with its clusters of prickly flowers; or a young pine arise out of a yellow brake of marine rushes. When these trees have acquired a certain degree of growth and size, they stifle by their shade those thorny plants, which subsist no longer, except along the skirts of the wood, where they enjoy air sufficient for their vegetation. But in this situation, such plants are still going on to extend the empire of their superiors from year to year over the plants. (Thus the thorny plants are the original cradles of the forests; and the scourge of the agriculture of man is the bulwark of that of Nature.)

Nature employs the birds particularly to sow the thorny plants in steep and inaccessible places. They are accustomed to retire thither in the night, and deposit with their dung the stony seeds of most thorny shrubs, which are indigestible in their stomach. They are not only supplied by those vegetables with food and shelter, but down for lining their nests, as on thistles, and on the cotton tree of America.

Independently of the plants proper to each situation, some flit round the earth, caused by several plants shedding their seeds only at the season when certain regular winds blow, or at certain revolutions of the currents of the ocean. I am of opinion, however, that we must rank under this description many plants known to the ancients, but not now to be found.

It may merit observation, that those vegetable apparitions have been contemporary with several species of flitting birds, which have likewise disappeared. It is well known several classes of birds and fishes migrate incessantly; some in a certain revolution of days; others at the end of a certain period of years. Many plants may be subjected to a similar destiny. This law extends even to the heavens, where some new star is from time to time appearing. Nature has always some novelty in reserve, to keep man continually in exercise. She has established, in the duration of the existence of the different beings, concerts of a moment, hour, day, moon, year, of the life of man, the duration of a cedar, and perhaps that of a globe: but this undoubtedly is known to the SUPREME BEING alone.

I am persuaded, at the same time, that the greatest part of flitting plants must have a principal centre, such as a steep rock, or an island in the sea, from whence they diffuse themselves over the world. ✕ This leads me to deduce, what I consider as an irrefragable argument in support of the recent creation of our globe: were it of very remote antiquity, all the possible combinations of the propagation of plants by seed, would have been already completed all over the world. Now it is unquestionably certain, that the radiations of the cocoa-tree and its fruit, the principal foci of which are in the Maldivia Islands, are not hitherto diffused over all the islands of the Indian Ocean.

✕ This reflection evidently demonstrates the newness of the world. Were it eternal, and without a Providence, its vegetables would long since have undergone all the possible combinations of the chance which resows them. We should find their different species wherever they could grow. From this observation I infer, That the AUTHOR of Nature evidently intended to link mankind together by a reciprocal communication of benefits, the chain of which is yet incomplete.

VEGETABLE HARMONIES OF PLANTS.

✕ The verdure of plants, so grateful to the eye, is a harmony of yellow, the colour of the earth, and blue, the colour of the heavens. Had Nature dyed plants yellow, they would have been confounded with the ground; if blue, with the heavens and the waters. In the first case, all would have appeared earth; in the second, sea: but their verdure gives them de-

lightful contrasts with the grounds of this magnificent picture, and consonances equally agreeable with the yellow colour of the earth, and the azure of the heavens.

The green colour possesses this farther advantage, it wonderfully accords with all the others, from its being the harmony of the two extreme colours. Painters of taste hang their exhibition-rooms with green, that the pictures, of whatever colours, may detach themselves from that ground without harshness, and harmonize upon it without confusion. But though Nature employs but one single colour in arraying so many plants, she varies the tints so endlessly, that each plant has one peculiar to itself, detaching it sufficiently from its neighbour; and these are varying daily from the commencement of spring, when they appear in a bloody verdure, to the last days of autumn, and then they are transformed into various yellows.

Nature, after having thus harmonized the ground of her picture, has detached from it every vegetable in particular, by means of contrasts. The most beautiful of forms is the spherical; and the most agreeable contrast it is capable of presenting, is when found in opposition to the radiating form. Indeed, I am persuaded there is not a vegetable but what has its opposite in some part of the earth; their mutual harmony is the cause of the secret pleasure we feel in wild rural scenes, where Nature is at liberty to combine them.

The harmonies resulting from contrast are to be found even in the waters. The reed, on the brink of rivers, raises into the air its radiating leaves, and its imbrowned distaff, whereas the nymphæa extends at its feet a broad heart-formed foliage, and roses of yellow gold: the one presents on the waters a continued palisade, the other a platform of verdure.

I apprehend that the qualities of plants are harmonic as their forms; that when we find them grouped agreeably and constantly, there must result from the union of their qualities for nourishment, health, or pleasure, a harmony as agreeable as the contrast of their figures.

On the imbrowned angles of the rock, under the shade of ancient beech-trees, the mushroom, white and round as an ivory piece for the chess-board, arises out of a bed of moss of the most beautiful green. It alone presents a multitude of unknown consonances and contrasts, and is the most varied vegetable of our climates. Sebastian le Vail-

lant enumerates 104 species in the vicinity of Paris, without reckoning the fungoids, which furnish at least a dozen more. Nature has dispersed them over most shady places, where they form contrasts the most extraordinary. Some thrive only on the naked rock, where they present a forest of small filaments, each supporting its particular chapter ; some grow on substances the most abject, with forms the most solemn ; such is that which thrives on what falls from the horse, and which resembles a Roman hat, whence its name. Others present agreeable consonances ; as that which grows at the foot of the alder, under the form of a cockle.

✕This numerous tribe appears to have its destiny attached to that of the trees, which have each a mushroom appropriated to itself, and rarely to be found elsewhere : such are those which grow only on the roots of plum trees and pines. To no purpose does heaven pour down its copious rains ; the mushroom, under covert of its umbrella, receives not a single drop. They derive the whole support of life from the earth, and from the potent vegetable to whose fortune they have united their own.

Nature has established in the numerous tribes of the vegetable kingdom, a multitude of alliances, the end of which is unknown to us. There are plants, for example, the sexes of which are on different individuals, as in the animal creation. Others whom you always find united in clusters, as if they loved to live in society ; others, on the contrary, are almost always in a state of solitude. I presume that many of these relations are connected with the character of the birds which live on their fruits, and resow them. Nature frequently employs the aerial vapours to give a greater extent to our landscapes. She sometimes withdraws this magic veil from the bottom of the valleys ; and rolling it over the adjacent mountains, on which she tinges it with vermilion and azure, she confounds the circumference of the earth with the vault of heaven : thus employing clouds evanescent as the illusions of human life, to raise us to heaven ; thus expanding over her most profound mysteries, the ineffable sensations of infinity, she withdraws from our senses the perception of her works, to convey to our minds a more impressive feeling of them.

ANIMAL HARMONIES OF PLANTS.

Nature, after having established on a soil formed of fragments insensible and lifeless, vegetables endowed with principles of life, growth, and generation, accommodated to them animals, which had, besides the power of self-motion, dispositions to inhabit them, passions to derive their nourishment, and an instinct to make a proper choice of them. I shall speak only of their most common relations to plants.

In an order entirely new, Nature has not changed her laws: she has established the same harmonies and contrasts of animals to plants, as of plants to the elements. It would appear natural to our feeble reason, and consonant to the principles of our sciences, that so many sensible beings produced in the midst of verdure, should be in time affected by it. The impressions of their parents, added to those of their own infancy, acquiring in them increasing strength, from generation to generation, by new tints, ought at length to exhibit oxen and sheep as green as the grass on which they pasture. We have observed in the preceding Study, that as vegetables were detached from the ground by their green colour, animals which live on verdure distinguish themselves from it by their dusky colours; and those which live on the dusky bark of trees, or on other dark grounds, are invested with colours brilliant, and sometimes green.

Many species of Indian birds which live amidst the foliage of trees, as paroquets, many of the colibri, and even turtles, are of the finest green; but independently of the white, blue, and red marbled spots, which distinguish their tribes on the trees, their brilliant plumage greatly detaches them from the solemn and imbrowned verdure of those southern forests. We have seen that Nature employs this to diminish the reflexes of heat; but that she might not confound the objects of her picture, if she has darkened the ground of her scene, she has bestowed greater brilliancy on the dresses of the actors.

Nature has appropriated the species of animals agreeably coloured to that of vegetables whose flowers are least vivid, as a compensation. There are fewer brilliant flowers between the tropics than in the temperate zones; and, as a compensation, the insects, birds, and even quadrupeds, are there arrayed in the most lively colours. When they rest on their proper

vegetable, they form with them the most beautiful contrast, the most lively harmonies. An attentive consideration of these oppositions and analogies, would lead us to a discovery of the plant peculiarly adapted to each animal. Naturalists, in their histories of birds, class them according to the feet, bill, and nostrils. They sometimes speak of the seasons of their appearance, but scarcely ever of the trees they frequent; every animal, however, may be referred to its own particular corresponding plant.

✕ We have divided plants into aerial, aquatic, and terrestrial, as animals themselves are divisible, and we have found in the two extreme classes unvarying harmonies with their elements. They may be farther divided into two classes, into trees and herbs, as animals likewise are into volatile and quadrupeds. Nature does not associate the two kingdoms in consonances, but in contrasts; and by means of these oppositions she bestows adaptations of protection to the feeble, and of accommodation to the powerful.

If we observe the relations of grasses to quadrupeds, we shall find that, notwithstanding their apparent contrasts, there is actually between them a multitude of real correspondences. The moderate elevation of gramineous plants places them within reach of the jaws of quadrupeds, whose head is in a horizontal position, and frequently inclined towards the ground. Their delicate shoots are suited to their broad and fleshy lips; their tender stems to be easily snapped by the incisive teeth; their mealy seeds easily bruised by the grinders. Besides, their bushy tufts, elastic without being ligneous, present soft litter to ponderous bodies.

If, on the contrary, we examine the correspondences between trees and birds, we shall find that branches of trees may be easily clasped by the four-toed feet of most birds, which Nature has so disposed, that by means of three before and one behind, they may be able to grasp the bough as with a hand. Again, the birds find in the different tiers of the foliage, a shelter against the rain, sun, and cold, towards which the thickness of the trunks farther contribute. The apertures formed in these, and their mosses, furnish situations and materials for building their nests. The round or oblong seeds of trees are suited to their bills. Such as bear fleshy fruits are resorted to by birds which have beaks pointed or crooked like a pickaxe.

Nature has farther accommodated animals of a third order, which find in the bark, or in the flower of a plant, as many conveniences as the quadruped has in the meadow, or the bird in the whole tree: I mean insects. This order appears to be particularly appropriated to trees. Pliny observes that ants are fond of the grains of the cypress. He tells us, that they attack the cones which contain them, on their half opening as they arrive at maturity, and plunder them to their very last seed; and he considers it as a miracle of Nature, that an insect so diminutive should destroy the seed of one of the largest trees in the world.

I am persuaded there is not a single vegetable but what has connected with it at least one individual of each of the six general classes of insects, acknowledged by naturalists. By referring insects to the different parts of plants, we alone can discern why Nature bestowed on those diminutive animals figures so extraordinary. We should then comprehend the uses of their utensils, hitherto mostly unknown; and have new occasions to admire the Divine Intelligence, and perfect our own.

The duration of vegetables is unequal, though subjugated to the influences of the same elements. The oak serves as a monument to the nations; and the *nostocium*, which grows at its foot, lives only a single day. All I shall say upon this head in general is, that the period of their decay is by no means regulated by that of their growth; neither is their fecundity proportioned to their weakness, to climates, or to seasons, as some have pretended, but to the demands of animal life. Many plants expire when they have yielded, and committed their seed to the winds. There are some, such as mushrooms, whose existence is limited to a few days, as the species of flies which feed upon them. Others retain their seeds all the winter through, for the use of the birds; such are the fruits of most shrubs.

Other plants have relations to animals the more tenderly affecting, in proportion as climates and seasons seem to exercise over the animal the greater degree of severity. Were we enabled to investigate these adaptations to the bottom, they would explain all the varieties of vegetation, in every latitude and season.

There are fruits, as the jaque and mango, which animals can smell at a great distance when the fruit is to windward.

I believe this property of emitting a powerful perfume is common to such of our fruits as lie concealed under the foliage, apricots, for instance ; other vegetables manifest themselves only in the night-time. The jalap of Peru, or the belle of the night, opens not her strongly-scented flowers except in the dark. The flower of the nasturtium, a native of the same country, emits in the dark a phosphoric light, first observed in Europe by a daughter of the celebrated Linnæus.

The properties of these plants convey a happy idea of those delightful climates where the nights are sufficiently calm and luminous to disclose a new order of society among animals. There is a species of luminous flies, which scatter themselves in the groves of fruit-trees in the darkest nights, darting at once, by beating of their wings, a dozen of fiery streams, which illuminate the foliage and fruits of the trees with a golden and bluish light ;* then, all at once repressing their motion, they plunge again into obscurity.

Were we to study the relations of plants to animals, we should perceive the use of many of the parts, frequently considered as productions of the caprice and confusion of Nature. [So widely extended are those relations, that there is not a down upon a plant, an intertexture of a shrub, a cavity, a colour of leaf, or a prickle, but what has its utility.] Those wonderful harmonies are especially to be remarked in the lodgings and nests of animals. If in hot countries there are downy plants, it is because there are moths entirely naked, which clip off their fleece and weave it into clothing. On the banks of the Amazon is a species of reed from 25 to 30 feet high, crowned with a large ball of earth, the workmanship of the ants, which retire thither at the time of the rains and inundations of that river : they go up and descend along the cavity of this reed, and live on the refuse then swimming on the surface of the water.

To furnish similar retreats for small insects, Nature has hollowed the stems of most of our plants of the shore. The valisneria which grows in the Rhone, and carries its flower on a spiral stem, capable of being drawn out in proportion to the rapidity of the sudden swellings of that river, has holes at the basis of its leaves, the use of which is much more extraordinary. If you take up this plant by the root, and put

* Consult Father du Tertre.

it into a vessel full of water, you perceive at the basis of its leaves masses of bluish jelly, which insensibly lengthen into pyramids of a beautiful red. These presently furrow themselves into flutings, which disengage from the summit, invert themselves all around, and present by their expansion very beautiful flowers formed of purple, yellow, and blue rays. By degrees these flowers advance out of their cavity, and withdraw from the plant, remaining however attached to it by a small filament. You then perceive each of the rays composing those flowers assume a motion peculiar to itself, which communicates a circular movement to the water, and precipitates to the centre all the small bodies floating around. If those wonderful expansions are disturbed by any sudden shock, immediately every filament contracts, all the rays close, and the pyramids retire into their cavities; for those pretended flowers are polypi.

There are in certain plants parts which may be considered as characters of uncultivated Nature, but which, like all the rest of her works, are evident proofs of the wisdom and providence of her Author; such as prickles, whose forms are varied without end, especially in hot countries, where it was necessary many of the trees should be armed with thorns, because quadrupeds are there to be found capable of climbing them to eat the eggs and young of birds.

There are, in the Antilles Islands, trees which have no thorny prickles, but more ingeniously protected than if they had. A plant known there by the name of the prickly thistle, by crossing its branches, forms an enclosure no quadruped dares to approach. It likewise produces a fruit grateful to the palate.

In those countries the thorns upon the trees afford protection even to the insects. Bees there carry on their honey-making process in the aged trunks of prickly trees hollowed by the hand of Time. It is very remarkable that Nature, who has provided this resource for the bees of America, has withheld from them a sting, as if those on the trees were sufficient for their defence. I believe that to this reason it may be ascribed, though no attention has been paid to it, that we have never hitherto been able to rear in the Antilles Islands the honey-bees of the country. They refused no doubt to take up their abodes in domestic hives, because they did not consider themselves as there in a state of security;

but might perhaps have been induced to make that choice, had the hives to which they were invited been decorated and defended by thorns.

If Nature employs prickly vegetables for the defence even of flies against the attacks of quadrupeds, she sometimes makes use of the same means for delivering quadrupeds from the persecution of common flies. She has in truth bestowed on those most exposed to it manes and tails, armed with long hair, to drive them away; but the multiplication of those insects is so rapid in warm and humid seasons and countries, as to threaten destruction to the whole race of animals. One of the vegetable barriers opposed to them by Nature is the *dionæa muscipula*. This plant bears on one and the same branch opposite little leaves, besmeared with a sugary liquor resembling manna, and studded with very sharp prickles. When a fly perches on one of those little leaves, they instantly close with a spring, like the jaws of a wolf-trap, and the fly is spitted through and through.

There is another species of the *dionæa* which catches those insects with its flower. When a fly attempts to extract its nectareous juices, the corolla, which is tubulous, shuts at the collar, seizes the insect by the proboscis, and thus puts it to death. This plant is cultivated in the Royal Garden. It is observable that its cup-formed flower is white, radiated with red, and that these two colours universally attract flies, from their natural avidity of milk and of blood.

But there is no occasion to resort to foreign plants for ascertaining the existence of vegetable relations to animal. The bramble, which affords in every field shelter to the birds, has its prickles formed into hooks; so that it not only prevents the cattle from disturbing the birds' retirement, but frequently lays them under contribution for a flake of wool or hair proper for finishing off their nests.

× Did we know the animal relations of plants, we should possess sources of intelligence respecting the instincts of the brute creation with which we are totally unacquainted. We should know the origin of their friendships and animosities, at least as to those formed in society; for with regard to such as are innate, I do not believe the cause of them was ever revealed to any man. × These are of a different order, and belong to another world. The foundation of all this variety of pleasant and useful knowledge is laid in the study of

plants. Each of them is the focus of the life of animals, the species of which there collect in a point, as the rays of a circle at their centre.

As soon as the sun has given the signal of spring to our hemisphere, the rainy and warm wind of the south takes its departure from Africa ; and when this revolution, known all over the globe by the name of the equinoctial gale, has taken place, in the month of March, the sun revolves night and day around our pole, so that there is not a single point in the whole northern hemisphere that can escape his heat. Every step he advances through the heavens, a new plant appears on the earth. Each arises in succession, and occupies its proper station at the hour assigned to it ; at one and the same instant it receives the light in its flowers and the dew of heaven on its foliage. In proportion to its progress in growth, the insect tribes which thence derive their nourishment likewise display their existence and unfold their characters. At this epocha, too, each species of bird resorts to the plant with which she is acquainted, to build her nest, and feed her young with the animal prey it presents, to supply the want of its seeds not yet produced. We presently behold the tribes of birds of passage flock thither in quest of the portion which Nature has provided for them likewise. All these birds feed their young on the insects and reptiles which the newly expanded plants have fostered into life.

Then, too, the fishes issue in legions from the northern abysses of the ocean, allured to the mouths of rivers by clouds of insects, which are confined entirely to the waters, or expand into life along their banks. They stem the watery current in shoals, and advance skipping and springing up to the very sources of the stream. Quadrupeds themselves then undertake long peregrinations ; some proceed from south to north with the sun, others from east to west ; some coast along the rugged chains of mountains ; others follow the courses of unnavigated rivers. Lengthened columns of black cattle pasture in America along the banks of the Mississippi. Numerous squadrons of horses traverse the rivers and deserts of Tartary, and wild sheep stray bleating amidst its vast solitudes. These flocks have neither overseer nor shepherd to guide them through the desert, but the well-known expansion of herbage determines the moment of their departure and the limits of their progress ; then each animal inhabits

his natural situation ; then the chains of harmony exert all their force, and all, being animated by consonances or by contrasts, the air, waters, forests, and rocks, seem to be vocal, impassioned, transported with delight.

✕ But this vast concert can be comprehended by celestial intelligences only. To man it is sufficient, in order to study Nature with advantage, that he limit his researches to one single vegetable, suppose an aged tree in some solitary situation. The characters indicated, a judgment might easily be formed whether it be in its natural position ; but still better from its beauty, and the accessories Nature uniformly places in connexion with it, where man has not interposed to derange her operations. The student would first observe its elementary relations, and the striking characters of the different species of the same genus, some of which grow at the sources of rivers, others at the place of their discharge into the ocean. He would afterwards examine its convolvuluses, mosses, mistletoes, scolopendræ, the mushrooms of its roots, nay, the very grasses which grow under its shade. He would perceive in each of its vegetables new elementary relations, adapted to the places they occupy and to the tree which sustains or shelters them.

✕ His attention might next be directed to the various species of animals which resort to it as a habitation, and he would presently be convinced, that from the snail up to the squirrel there is not a single one but what has determinate and characteristic relations to the dependences of its vegetation.

If the tree in question were growing in a forest, itself too of considerable antiquity, it would most probably have in its vicinity the tree which Nature designed should contrast with it in the same site, as for example the birch with the fir. It is farther probable that the accessory vegetables and animals of this last would also form a contrast with those of the first. These two spheres of observation would mutually illuminate each other, and diffuse the clearest light over the manners of the animals which frequent them. Indeed, I am fully convinced that, without fatigue, and almost without trouble, curious discoveries might be made. Were we to restrict our inquiries but to one single compartment, we should discover a multitude of enchanting harmonies : but in order to enjoy some imperfect sketches of this kind we must have recourse to travellers.

There are birds which lodge not upon their favourite plant, but opposite to it. Such is the colibri, which frequently nestles, in the Antilles Islands, on the straw which thatches a cottage, in order to live under the protection of man. In our climates the nightingale constructs his nest under covert of a bush, choosing in preference such situations as repeat an echo, and carefully observing to expose it to the morning sun. Having employed such precautions, he takes his station in the vicinity, against the trunk of a tree; and there, confounded with the colour of its bark, and motionless, he becomes invisible. But he presently animates the obscure retreat which he has chosen by the divine melody of his song, and effaces all the brilliancy of plumage by the charms of his music.

✕ But whatever enchantment may be diffused by plants and animals over their situations in Nature, I never can consider a landscape as possessing all its beauty unless I perceive in it at least one little hut. [The habitation of man confers on vegetables a new degree of interest or majesty.] Our magnificent hotels in great cities are the habitation of tradesmen merely: in the country they are transformed into castles, palaces, temples. This is not in truth what I consider as most interesting in rural scenery. To the most ostentatious splendour I prefer the view of a hamlet of fishermen, built by the side of a river. With inexpressible delight have I sometimes reposed under the shade of willows and poplars on which were suspended the bow nets composed of their own branches.

I shall now take a rapid glance of the harmonies of plants with man; and that I may introduce them in order, shall divide them relatively to man himself, into *elementary*, *vegetable*, *animal*, and *human* properly so called, or *alimentary*.

HUMAN HARMONIES OF PLANTS.

Elementary Harmonies of Plants relatively to Man.

If we consider the vegetable order under the simple relations of strength and magnitude, we shall find it divided into three great classes, namely, herbs, shrubs, and trees. In the first place, herbs are of a substance pliant and soft. Had they been ligneous and hard, like the young boughs of trees, to which they ought naturally to have a resemblance, as they

grow on the same soil, the greatest part of the earth would have been inaccessible to the foot of man till the fire or hatchet had cleared the way for him. It was not by chance, therefore, that so many grasses, mosses, and herbs, assumed a soft and yielding texture, nor from want of nourishment or the means of expansion ; for some of those herbs rise to a very great height, such as the banana of India, and several ferulaceous plants of our own climates, which attain the stature of a little tree.

On the other hand, there are ligneous shrubs which do not exceed the generality of herbs in height, but they grow mostly on rugged and steep places, affording man the means of clambering with facility, for they shoot out of the very clefts of the rocks. But as there are rocks without clefts, which present the perpendicularity of a wall, there are likewise creeping plants at their bases, which rise in close cohesion to a height surpassing that of many of the tallest trees : such are the ivy, the virgin-vine, and a great number of the *lianne* tribe, which mantle along the rocks of the southern regions.

Were the earth covered with such vegetables, it would be impossible to walk over it. When uninhabited islands were discovered, some were found clothed with forests, others in which there was nothing but herbage and rushes, others carpeted with mosses simply, others, in great number, on which these several vegetables were blended ; But I do not know of a single one found to contain only shrubbery and liannes. Nature has placed this class on places not easily to be scaled, to facilitate access to man.

As to trees, though replenished with a vegetative force which elevates them to a very considerable height, the greater part do not send out their first branches but at a certain distance from the ground ; so that though they form, on attaining a certain degree of elevation, an intertexture impenetrable to the sun, they leave however about their roots avenues sufficient to render them accessible, so that the forests may be traversed with ease and expedition.

Such, then, are the general dispositions of vegetables upon the earth relatively to the occasion which man had to range over it. The herbage serves as a carpet to his feet, the shrubbery as a scaling-ladder to his hands, and the trees are as so many parasols over his head. Nature, after having established those propositions between them, has distributed them in all

the varieties of situation, by bestowing on them qualities the best adapted to minister to the necessities of man, and to compensate in his favour the inconveniences of climate.

Though this manner of studying her works be now held in contempt by most naturalists, to it, however, shall our researches be limited. We have just been considering plants according to their shape and size, after the manner of gardeners; we proceed farther to examine them as is done by the wood-seller, the huntsman, the carpenter, the fisherman, the shepherd, the sailor, nay, the nosegay-maker. It is of small importance whether we be learned, provided we cease not to be men.

In the north, and on cold mountains, the pine, the fir, the cedar, and most part of resinous trees grow, which shelter man from the snows by the closeness of their foliage, and furnish him in winter with torches and fuel for his fireside. The leaves of those ever-green trees are filiform, and thus adapted for reverberating the heat and resisting the violent winds that beat on elevated situations.

Mathiola says, no substance is more proper than the charcoal of those trees for promptly melting iron minerals, in the vicinity of which they peculiarly thrive. They are loaded with mosses, some species of which catch fire from the slightest spark. Being obliged on a certain occasion to pass the night in the lofty mountains of the Strait of Trento, where he was botanizing, he found a great quantity of larches (*larix*) bearded all over, and completely whitened with moss. The shepherds, willing to amuse him, set fire to the mosses, which was communicated with the rapidity of gunpowder touched with the match. Amidst the obscurity of night, the flame and sparks seemed to ascend up to the very heavens. They diffused a very agreeable perfume. He adds, that the best agaricum grows upon the larch, and that the arquebusiers of his time made use of it for keeping up fire and making matches. Thus Nature, in crowning cold and ferruginous mountains with those vast vegetable torches, has placed the match in their branches, tinder at their foot, and the steel at their roots.

To the south, on the contrary, trees present in their foliage fans, umbrellas, parasols. The latanier carries each of its leaves plaited as a fan, attached to a long tail, and similar, when completely displayed, to a radiating sun of verdure

The leaf of the banana resembles a long and broad girdle, which undoubtedly procured for it the name of Adam's fig-tree. The magnitude of the leaves of several species of trees increases as we approach the line; that of the cocoa-tree of the Sechelles Islands is from 12 to 15 feet long and 7 to 8 broad: a single one is sufficient to cover a numerous family.

Nature has provided in those climates parasols for whole villages; for the fig-tree, denominated in India the fig-tree of the Banians, grows on the very burning sand of the seashore, throwing shoots from the extremity of its branches, which drop to the ground, there take root, and form around the principal trunk covered arcades, impervious to the rays of the sun.

In our temperate climates we experience a similar benevolence of Nature. In the warm and thirsty season, she bestows upon us fruits replenished with refreshing juices, as cherries, peaches, melons; and as winter approaches, those which warm and comfort by their oils, as the almond and the walnut. She has placed other vegetables in humid and dry situations, the qualities of which are inexplicable on the principles of our physics, but which admirably harmonize with the necessities of the men who inhabit those places. Along the water-side grow the plants and trees which are driest, lightest, and consequently best adapted to the purpose of crossing the stream, as reeds and rushes. It requires but a moderate bundle of rushes to bear the weight of a heavy man upon the water. On the banks of the northern lakes are produced enormous birch-trees, the bark of a single one being sufficient to form a large canoe; it is similar to leather in pliancy, and so incorruptible by humidity, that in Russia I have seen some of it extracted from under the earth which covered powder magazines, perfectly sound, though it had lain there from the time of Peter the Great.

If we may depend on the testimony of Pliny and Plutarch, there were found at Rome, 400 years after the death of Numa, the books that great king had commanded to be deposited with his body in the tomb. The body was consumed, but the books on philosophy and religion were in such preservation, that Petilius, the prætor, undertook to read them by command of the senate. On the report he made of their contents, they were ordered to be burned. They were written on the bark of the birch-tree, which consists of an accumula-

mon of ten or twelve sheets, white and thin like paper, the place of which it supplied to the ancients.

Nature presents to man different trajectiles on different shores. On the banks of the rivers of India, the bamboo, an enormous reed, rises sometimes to the height of sixty feet, and swells to the size of a man's thigh; in the Maldivia Islands, the cocoa-tree, of all others most useful to mariners, grows on the shores of the seas most frequented by men of that description. Before the cocoa-nut comes to perfect maturity, it contains a liquor which is an excellent anti-scorbutic. Is it not then a miracle of Nature that this fruit, replenished with such milk, should come to a perfection on the barren strand, and within the washing of the briny deep? Nay, it is only on the brink of the sea that the tree which bears it arrives at its highest beauty; for few are to be seen in the interior of countries.

The care of Providence in contriving a supply for the thirst of man in sultry places, is no less worthy of admiration. Nature has placed amidst the burning sands of Africa a plant, whose leaf, twisted round like a cruet, is always filled with a large glass-full of fresh water; the gullet of this cruet is shut by the extremity of the leaf itself, so as to prevent the water from evaporating. She has planted on some parched districts of the same country a great tree, called by the negroes *Boa*, the trunk of which, of a prodigious bulk, is naturally hollowed like a cistern. In the rainy season it receives its fill of water, which continues fresh and cool in the greatest heats, by means of the tufted foliage which crowns its summit. Finally, she has placed vegetable fountains on the parched rocks of the Antilles. There is commonly found on them a lianne, called the water-lianne, so full of sap, that if you cut a single branch of it, as much water is immediately discharged as a man can drink at a draught: it is perfectly pure and limpid.

In the swamps of the Bay of Campeachy travellers find relief of another kind. Those swamps are inundated in the rainy season, and become so parched in dry weather, that many huntsmen who miss their way in the forests actually perish with thirst. The celebrated traveller Dampier relates that he several times escaped this calamity by means of a very extraordinary species of vegetation to be found on the trunk of a kind of pine very common; it resembles leaves

piled one over another in tiers, and on account of its form, and of the tree on which it grows, he calls it the pine-apple. This apple is full of water, so that on piercing it at the basis, there immediately flows from it a good pint of clear and wholesome water.

Such are in part the precautions employed by Providence for compensating, in favour of man, the inconveniences of every climate, by opposing to the qualities of the elements contrary qualities in vegetables. I shall pursue them no farther, for I believe the subject to be inexhaustible. I am persuaded every latitude and season has its own appropriate to it, and that every parallel varies them in every degree of longitude.

Vegetable Harmonies of Plants with Man.

The infinity of vegetable relations of plants to man are the sources of our arts, manufactures, commerce, and enjoyments; we shall but just touch on a few of our natural and direct relations with which man has intermingled nothing of his own.

To begin with their perfumes, man is the only sensible being affected by these. Animals, it is granted, especially bees and butterflies, have appropriate plants which attract or repel them by their emanations, but these affections seem to be connected with their necessities. Man alone is sensible to the perfume and lustre of flowers, independently of all animal appetite. The domestic dog, who assumes so powerful a tincture of the manners and tastes of man, appears totally insensible to that enjoyment. The impression which flowers make upon us seems connected with some moral affection, some enlivening, while others dispose us to melancholy, without our being able to assign any other reasons for it than those unfolded in examining some general laws of Nature.

Instead of distinguishing them as yellow, red, blue, violet, we might divide them into gay, serious, or melancholy: their character is so expressive, that lovers in the east employ their shades to describe the different degrees of their passion. Nature makes frequent use of it relatively to us with the same intention. When she wants to keep us at a distance from a marshy and unwholesome place, she scatters there poisonous plants, of dingy colours and offensive smells; but

their number is of no great extent. The earth is clothed with flowers mostly of pleasing hues and perfumes. The simple aggregation of flowers is a subject so vast, so rich, as to present ample employment for the whole life of the most famous botanist in Europe, by daily discovering to him some new beauty within a league of his own habitation. All the art with which jewellers dispose their gems disappears before that which Nature displays in the assortment of flowers.

Walking with J. J. Rousseau one day, I showed him the flowers of different trefoils which I had picked up, some disposed in crowns, half-crowns, ears, sheaves, with colours endlessly varied. While yet on their stems they had besides other aggregations, with the plants frequently opposed to them in colours and forms. I asked whether botanists gave themselves any trouble about those harmonies: he told me no, but that he advised a young painter of Lyons to learn botany, with a particular view to study in it the forms and assemblages of flowers, who had thus become one of the most celebrated pattern-drawers in Europe.

It is remarkable that odoriferous flowers grow at the foot of man, or at least within reach of his hand; they are placed on herbage, or on shrubbery, as the heliotrope, pink, gilly-flower, violet, rose, and lilac. Nothing similar grows on the lofty trees of our forests; and if some brilliant flowers are displayed on certain tall trees of foreign countries, they have no very pleasant smell. I may be mistaken in some of my observations, but general consequences deduced from them demonstrate to man the invariable intentions of benevolence in the AUTHOR of Nature. The varieties of their adaptation reflect mutual light; the means are different, but the end is constantly the same. (That goodness which has placed fruit for the nourishment of man within reach of his hand, must have likewise disposed his nosegay with similar attention to his conveniency.)

On the other relations of plants with the habitation of man, from their greatness and attitude, I shall just observe, there are few of them but what are capable of embellishing his field, his roof, or his wall; the vicinity of man is beneficial to many plants.

Animal Harmonies of Plants with Man.

[Nature, not satisfied with having given to man a bower, and a carpet, loaded with fruit, furnished him also, in the

vegetable order itself, with the means of defence against the depredations of wild beasts by night : she has enclosed him with a prickly shrubbery. The farther we advance southward we find the greater variety in the species of these ; but we see few, if any, thorny shrubs in the north, there being there no orchards to defend. They seem to be produced in both Indies for all situations. Though I have been only on the selvage, as I may say, of those countries, I have seen many such shrubs, the study of which presented a variety of curious remarks to the naturalist.

Among others, I particularly noticed one in a garden on the Isle of France, which appeared proper for composing a fence impenetrable to the smallest of quadrupeds. It rises in form of a stake about the thickness of a man's arm, quite straight, without branches, and bearing no verdure except a small bunch of leaves on its summit. Its bark is bristled with very strong and sharp prickles. It attains the height of seven or eight feet, and grows as thick above as below. A series of these shrubs, planted close to each other, would form a real palisado, without the smallest interval. The opuntia and the taper, so common under the torrid zone, are armed with prickles so keen, that they pierce the soles of your shoes if you venture to walk over them. There is not a tiger, lion, or elephant, that dares to approach them. There is another species of thorn in the island of Ceylon, which is employed as a defence against even man himself. According to Robert Knox, the avenues of the island of Ceylon are blockaded only with fagots of those thorns.

In vegetables man finds protection not only against ferocious animals, but reptiles and insects. Father du Tertre asserts that he found at the foot of a tree, in Guadaloupe, a creeping plant, the stem of which resembled a serpent ; but he was much more surprised on perceiving seven or eight snakes lying dead around it. He communicated this discovery to a medical man, who, by means of it, performed many wonderful cures in cases of persons bitten by those dangerous reptiles. It is generally diffused over the Antilles Islands, and known by the name of snake wood. It is likewise found in the East Indies. Linschoten ascribes to it the same figure and qualities.

In our climates we have vegetables which present strange correspondences and contrasts with reptiles. Pliny says ser-

pents are fond of the juniper and fennel, but are rarely found under the fern, trefoil, ash-weed, or rue, and that betony kills them. Other plants destroy flies, such as certain species of the *dionæa*. Thevenot assures us that in the Indies grooms defend their horses from flies, by rubbing them every morning with the flowers of the pumpkin. The fleabane, which bears black and shining grains resembling a flea, clears the house of that vermin, if Dioscorides is to be credited. The echium, which has its seed formed like the head of a viper, is fatal to those reptiles. It is probable, that from such configurations men, in the earlier ages of the world, discovered the relations and oppositions between plants and animals. I am disposed to believe that each genus of insect has its destructive vegetable with which we are unacquainted. In general, all vermin shun perfume.

Human or elementary Harmonies of Plants.

[All plants have certain relations to the necessities of man, and serve him either for clothing, shelter, pleasure, medicine, or at least fuel. Some, useless with us, are in high estimation in other parts of the world.] The Egyptians pray for a plentiful crop of nettles, from the seeds of which they extract an oil, while the stem furnishes them with a thread, which they weave into excellent cloth.

Corn, the general subsistence of the human race, is not produced by vegetables of lofty stature, but by simple grasses. The principal support of human life is borne on herbage, and exposed to the mercy of every breath of wind. Had we ourselves been intrusted with the safety of crops, we should not have failed to place them on great trees; but in this, as in every thing else, we are bound to admire Divine Providence, and mistrust our own wisdom. Had our harvests been the produce of forests, in the event of these being destroyed by war, or set on fire through our own imprudence, or rooted up by the winds, or ravaged by inundations, whole ages would have been requisite to reproduce them in a country. Farther, the fruits of trees are much more liable to drop off than the seeds of grasses. The grasses carry their flowers in an ear, in many cases surmounted by little beards, which do not defend their seeds from the birds, as Cicero says, but which serve as so many little roofs to shelter them from rain, which cannot drown them, as it does flowers radiated, in

disks, roses, and umbels, the forms of which however are adapted to certain places and seasons; but those of the grasses are adapted to every exposure.

When borne in flowing and drooping plumes, as those of most grasses of hot countries, they are sheltered from the heat of the sun, and when collected into an ear, as those of most grasses of cold countries, they reflect his rays on at least one side. Farther, by the suppleness of their stems, strengthened by joints from distance to distance, and by their filiform and capillaceous leaves, they escape the violence of the winds. Their weakness avails them more than strength does the great trees. Like small fortunes, they are resown and multiplied by the very same tempests which lay waste the vast forests.

They farther resist the effect of excessive dryness by the length of their roots, which go in quest of moisture a great way under ground; and though their leaves are narrow, they have them in such numbers, that they cover the face of the ground with plants endlessly multiplied. At the slightest shower you see them all rear themselves into the air, at their extremities, as if they were so many claws. They even resist conflagration, which consumes so many trees in the forest. I have seen countries, in which they every year set the herbage on fire in the season of the drought, recover themselves as soon as it rained, with the most lovely verdure.

Though this fire be so active as frequently to devour, root and branch, the trees which come into contact with it, the roots of herbage sustain no great injury.

They have, moreover, the faculty of reproducing themselves in three different ways, by shoots which push a way from their roots, by creeping branches, which they extend to a distance, and by grains extremely volatile or indigestible, which the winds and animals scatter about on every side. The greatest part of trees, on the contrary, naturally generate themselves only by their seeds. Add to the general advantages of grasses, an astonishing variety of characters in their florification and attitudes, which render them more proper than vegetables of any other class to grow in every variety of situation.

It is in this cosmopolite family, if I may be allowed the expression, that Nature has placed the principal aliment of man; for the various species of corns, on which so many human

tribes subsist, are only so many species of grasses. There is no land on the globe where some kind of corn or another may not be raised. Corn affords an abundant supply to all the necessities of man. With its straw he enjoys the means of lodging, covering, warming himself, and of feeding his sheep, cow, and horse ; with its grain he can compound aliments and liquors of every flavour. The northern nations brew it into beer, and distil from it strong waters more potent than those from wine ; such are the distillations of Dantzic. The Chinese* extract from rice a wine as agreeable as the best wine of Spain. The Brazilians prepare their *ouicou* with maize. In a word, with oats torrefied it is possible to compose a cream which shall have the perfume of the vanilla. If we unite with these qualities those of the other domestic plants, most of which likewise grow all over the earth, we shall find in them the savour of the clove, of pepper, of other spiceries ; and without going farther than our own gardens, we shall be able to collect the delicacies scattered over the rest of the vegetable creation.

Nature having formed in general of a mealy substance the basis of human life, has diffused it over all situations, on different species of grasses ; that afterwards, intending to add to this certain modifications relative to some humours of the human temperament, or to some influence of season or of climate, she has formed other combinations of it, which she has deposited in leguminous plants, such as peas and beans, which the Romans comprehended in the class of corn-plants ; that, finally, she has formed another sort of it, in the fruits of trees, as chesnuts, or in roots, as potatoes and other farinaceous under-ground vegetables.

Those adaptations of substance to every climate are so infallibly certain, that, in every country, the fruit most common there is the best and most wholesome. Hence I presume she has followed the same plan with respect to medicinal plants ; and that having diffused over various families of vegetables virtues relative to our blood, nerves, or humours, she has modified them in every country conformably to the diseases there generated, and placed them in opposition with the particular characters of those same diseases. From the neglect of these observations, many doubts and disputes have

* Journey to China, by Isbrand Ides.

been excited respecting the virtues of plants. A simple, which in one country is an infallible cure for a malady, may sometimes increase it in another. The jesuits' powder, which is the pounded bark of a species of fresh water manglier of Mexico, is a remedy for the fevers of America, peculiar to damp and hot situations, but frequently fails when applied to those of Europe. Every medicine is modified according to the place, just as every malady is.]

I shall pursue this reflection no farther; [but if physicians would pay the attention to it which it merits, they must study more carefully the plants of their own country, and not prefer, as they generally do, those of foreign climates, which they must modify a thousand different ways, to give them, as chance may direct, an adaptation to local remedies.] When Nature has determined a certain savour in any vegetable, she repeats it all over the earth with a variety of modifications, which do not, however, prevent our distinguishing its principal virtue. Thus, having placed the *cochlearia* (scurvy grass), that powerful antiscorbutic, even on the foggy shores of Spitzbergen, she has repeated its savour and medicinal qualities, in the cresses of our brooks and gardens. We find, in like manner, the savour, smell, and medicinal qualities of our garlic, in the woods, barks, and mosses of America.*

These considerations induce me to believe that the elementary characters of plants, and their entire configuration, are only secondary means, and that their principal character is referable to the necessities of man. It would be useful to ascertain the places to which the origin of each alimentary plant might be referred. I am of opinion, that Nature has placed in islands the species of plants most beautiful, and best adapted to the necessities of man. First, islands are more favourable to the elementary expansions of plants than the interior of continents. Secondly, their particular temperature is so varied, that you find some of them in all the principal points of longitude and latitude. Finally, experience demonstrates that European fruit-trees become more beautiful in some of the islands along the coast, than in the continent.

* Garlic, the smell of which is so formidable to our fine ladies, is perhaps the most infallible remedy in the world against the vapours, and all the nervous disorders to which women are subject. Of this I have had repeated experience. Nay, Pliny says it is a cure for the epilepsy.

I have spoken of the beauty of the chesnut-trees of Corsica and Sicily : but Pliny informs us most of them had been imported from the islands of the Archipelago. He observes that the olive-tree, as well as several other plants, thrive only in the vicinity of the sea. All modern travellers confirm these observations. An anonymous English traveller positively asserts, that nowhere on the continent are there to be found fruit-trees, once to be compared, for magnitude or fertility, with those of the Archipelago, notwithstanding the carelessness and indolence of the wretched possessors.

These observations might be extended even to birds and quadrupeds, more beautiful and varied in islands than anywhere else. The elephants held in highest estimation in Asia are those of the island of Ceylon. The Indians believe them to be possessed of something divine ; nay, more, they allege that other elephants acknowledge this superiority. One thing is certain, they fetch a higher price all over Asia than any others. In a word, travellers the most worthy of credit assure us, that there is not a shallow in the seas between the tropics, but what is distinguished by some sort of bird, crab, turtle, or fish, nowhere else to be found so varied or in such abundance. (I presume Nature has thus scattered her choicest benefits over the islands, to allure men thither, and to pervade the earth. These are only conjectures, I grant, but they rarely deceive us when founded on the wisdom and goodness of the AUTHOR of Nature.)

The finest species of corn, therefore, which is wheat, might be referred to Sicily, where, in fact, they pretend it was originally found. This much is certain, that corn is nowhere indigenous but in Sicily, if, however, it still reперpetuates itself there spontaneously, as the ancients affirm.

After having determined in the same manner the other human accommodations of the grasses to different situations of ground, we might examine the grasses which exhibit marked relations to our domestic animals, the ox, horse, sheep, and dog. We might characterize them by the names of these animals. We should have the *gramen bovinum, equinum, ovinum, caninum*. The different species of these genera might afterwards be distinguished by the names of the places where they are found by the animals ; on the banks of rivers, among rocks, on sands, on mountains ; so that by the addition of the epithets, *fluviale, saxatile, arenosum, montanum*,

you might supply, in two words, all the verbose phraseology of our botanical composition.

We might apportion the other grasses to the quadrupeds of our forests, as the stag, hare, wild-boar, and so on. These first determinations would require certain instructive and amusing experiments to be made on the tastes of animals; they would have no mixture of cruelty, unlike our modern physics, by which the wretched animal is flayed alive, poisoned, or suffocated, to discover its propensities. Our experiments would study their appetites, not their convulsions. Besides, many of those preferred and rejected plants are already well known to our shepherds. One of them showed me, near Paris, a gramineous plant which fattens sheep more in a fortnight than the other species can do in two months. The moment the animals perceive it, they run after it with the utmost avidity. I do not mean, however, to assert that each species of animal limits its appetite to a single species of food. It is sufficient to establish the order I am proposing, that each of them gives, in every genus of plant, a decided preference to some one species; and this is fully confirmed by experience.

The great class of the gramineous plants being thus apportioned to man and animals, other plants would present still greater facility in their appropriations, because they are much less numerous. We should have an order simple, easy, agreeable, and extensive, which, passing from men to animals, to vegetables, and to elements, would discover the plants destined to our use, and that of other sensible beings, would render to each its elementary relations, to the earth its vegetable beauty, and replenish the heart of man with admiration and gratitude. (This plan appears so much the more conformable to that of Nature, that it is entirely comprehended in the benediction which its AUTHOR pronounced upon our first parents. Gen. i. 29, 30. This benediction is not confined, as far as man is concerned, to some primordial species in each genus. It is extended to the whole vegetable kingdom, which converts itself into aliment fit for his use by means of the domestic animals.)

I take delight in representing to myself those early ages of the world, when men travelled over the face of the earth attended by their flocks and herds, laying the whole vegetable kingdom under contribution. The sun going before

them in spring, invited them to advance to the north, and to return with autumn bringing up his train. His annual course in the heavens seems to be regulated by the progress of man over the earth. It is by regulating themselves according to the annual course of the sun that certain Tartar hordes still travel.

✕What a spectacle must the virgin earth have presented to its first inhabitants, while every thing was in its place, and Nature not yet degraded by the injudicious labours or desperate madness of man! I suppose them taking their departure from the banks of the Indus on a progress northward. They first crossed the snowy mountains of Bember, which, like a rampart, encompass the happy land of Cachemire, and separate it from the burning kingdom of Lahor.* They presented themselves to their eyes like vast amphitheatres of verdure, clothed, to the south, with all the vegetables of India, and to the north with all those of Europe. They descended into the vast bason which contains them, and beheld a part of the fruit-trees destined one day to enrich our orchards. The apricots of Media, and the peach-trees of Persia, skirted, with their blossoming boughs, the lakes and brooks of living water which bedew their roots. On leaving the ever-green valleys of Cachemire, they quickly penetrated into the forests of Europe, and reposed under the foliage of the stately beech and tufted elm, which had as yet shaded only the loves of the feathered race. They crossed the boundless meadows washed by the Irtis, resembling oceans of verdure, here and there diversified with long beds of yellow lilies, with stripes of ginseng, and tufts of broad-leaved rhubarb. Following the track of its current, they plunged into the forests of the north, under the majestic branches of the fir, and the moving foliage of the birch.

What smiling valleys opened to their view along the river's side, and invited them to deviate from the road, by promising them objects still more lovely! What hills enamelled with unknown flowers, and crowned with ancient and venerable trees, endeavoured to persuade them to proceed no farther! Arrived on the shores of the Icy Sea, a new order of things arose to view. There was now no more night. The sun encompassed the horizon round and round; and the mists,

* Consult Bernier's Description of the Mogul Country.

dispersed through the air, repeated on different planes the lustre of his rays in rainbows of purple, and parhelions of dazzling radiance. But if the magnificence of the heavens was multiplied, desolation covered the face of the earth. The ocean was hoary with mountains of floating ice, which appeared in the horizon like towers and cities in ruin; and on the land nothing was to be seen, in place of groves, but a wretched shrubbery blasted by the winds; and instead of verdant meads, rocks clothed with moss. Their flocks must there undoubtedly have perished, had not Nature still made provision for the necessities of man. Those shores were composed of massy beds of coal.* The seas swarmed with fishes, and the lakes with fowls. They must find among the animal tribes servants and assistants: the reindeer appeared in the middle of the mosses; she presented to those wandering families the services of the horse in her agility, the fleece of the sheep in her fur; and showing them, like the cow, her four teats, and but one nursling, she seemed to tell them that she was destined, like her, to share her milk with mothers oppressed by a too numerous offspring.

The eastern part of the globe must first have attracted the attention of mankind. That place of the horizon where the sun arises, undoubtedly fixed their wondering eyes, at a period when no system had interposed to regulate opinion. On seeing that great luminary arising from day to day, in the same quarter of the heavens, they must have been persuaded he there had a fixed habitation, and another where he set, as a place of rest. Such imaginations, confirmed by the testimony of their eyes, were, it must be admitted, natural to men destitute of experience, who had attempted to erect a tower which should reach to heaven, and who, even in more scientific ages, believed, as a point of religion, that the sun was drawn about in a chariot by horses, and retired every evening to repose in the arms of Thetis. I presume they would be determined to go in quest of him rather towards the east than west, under the persuasion that they would greatly abridge their labour by advancing to meet him.

✕ This conviction, I am disposed to think, left the west long in a deserted state, under the very same latitudes which in the east were swarming with inhabitants, and first sent men

* Professor Gmelin's Journey to Siberia.

in crowds towards the eastern part of our continent, where the earliest and most populous empire of the world, that of China, was formed. What confirms me farther in the belief that the first men who advanced towards the east were engaged in this research, and were in haste to reach their object, is this, that having taken their departure from India, like the founders of other nations, they did not people the earth progressively, as Persia, Greece, Italy, and Gaul, were successively in a westerly direction; but leaving desert the vast and fertile countries of Siam, Cochin-china, and Tonquin, to this day half barbarous and uninhabited, they never gave up the pursuit till they were stopped by the Eastern Ocean; and they gave to the islands they perceived at a distance, and on which they did not for a long time acquire the skill to land, the name of Gepuen, now transformed into Japan, and which in the Chinese language signifies Birth of the sun.

Father Kircher* assures us, that when the first Jesuit astronomers arrived in China, and there reformed the calendar, the Chinese believed the sun and the moon to be no bigger than they appear to the eye; that on setting they retired to a deep cave, from which they issued next day at the time of rising; and, finally, that the earth was a plane and smooth surface. Tacitus, in his history of Germany, relates the traditions of the western nations, who affirmed that towards the north-west the sun went to bed, and that they could hear the noise he made on plunging into the waves.

From the east, then, the orb of day first attracted the curiosity of mankind. There were likewise tribes which directed their course towards that point of the globe, taking their departure from the southern part of India. These advanced along the peninsula of Malacca; and, familiarized with the sea, which they coasted most of the way, they were induced to avail themselves of the united accommodation the two elements present to travellers, by navigating from island to island, and thus pervaded that vast belt of islands Nature has thrown into the torrid zone, like a bridge intersected by canals, to facilitate the communication of the two worlds. When retarded by tempests or contrary winds, they drew their barks ashore, cast a few seeds into the ground, reaped the crop, and deferred their re-embarkation till fairer weather,

* See China illustrated, chap. ix.

and a season more favourable, encouraged them to venture to sea again.

Thus it was that the early mariners performed their voyages, and that the Phenicians, employed by Necho king of Egypt, made the circuit of Africa in three years, departing by way of the Red Sea, and returning by the Mediterranean, according to Herodotus, book iv.

The first navigators, when they no longer saw islands in the horizon, paid attention to the seeds which the sea cast upon the shore, and to the flight of the birds withdrawing from it. On the faith of these indications, they directed their course, and discovered numberless islands, all of which invited them to land, by presenting some attractive accommodation. In these islands, the woods, hills, and downs, maintained some animal, naturally familiar and gentle, but which becomes savage only from the cruel experience it acquires of man. They saw fluttering around, as they disembarked on their strands, the silken-winged birds of paradise, the blue pigeons, the cacatoes all over white, the lauris all red. Every new island tendered them some new present; crabs, fishes, shells, pearl-oysters, lobsters, turtles, ambergris; but the most agreeable, beyond all doubt, were the vegetables. When they discovered a tree laden with unknown fruit, they gathered some branches of it, and ran to meet their companions with shouts of joy, exhibiting this new benefit of Nature.

From those early voyages and ancient customs, has been diffused over all nations the practice of consulting the flight of birds before engaging in any enterprise, and that of going to meet strangers with the branch of a tree in the hand, in token of peace, and of joy at sight of a present from Heaven. These customs still exist among the islanders of the South Sea and the free tribes of America. [But not fruit-trees alone fixed the attention of the first men. If some heroic action, or some irreparable disaster, had excited admiration, or inspired regret, the tree adjoining was ennobled by it. They preferred it, with those fruits of virtue or of love, to such as produced food or perfume. Thus in the islands of Greece and of Italy, the laurel became the symbol of triumph, and the cypress that of eternal sorrow. The oak supplied crowns of undecaying honour to the well-deserving citizen, and simple grasses decorated the brows of the men who had saved

their country. O Romans! ye were a people worthy of the empire of the world, in that you opened to every one of your subjects the career of virtuous exertion, and culled the most common plants of the field to serve as the badge of immortal glory, that a crown for the head of virtue might be found on every spot of the globe.

By similar attractions, from island to island, the nations of Asia made their way to the New World, where they landed on the shores of Peru. Thither they carried the name of children of that sun whom they were pursuing. This brilliant chimera imboldened them to attempt the passage to America. It was not dissipated till they reached the shores of the Atlantic Ocean: but it diffused itself over the whole continent, where most of the chiefs of the nations still assume the title of children of the sun.*

✕Mankind, encompassed with so many blessings, continues to be wretched. Animals live in abundance and liberty, the greatest part without labour, all at peace with their species, all united to the objects of their choice, and enjoying the felicity of perpetuating themselves by their families; whereas more than the half of mankind is doomed to celibacy. The other half curses the bonds which have matched him. The greater part tremble at the thought of rearing a progeny, fearful of being incapable to provide for them; while many, in order to support themselves, are subjected to painful labours, and reduced to be slaves to their fellow-creatures. Whole nations are exposed to perish by famine; others, destitute of territory, are piled on each other, while the greatest part of the globe is a wilderness.

There are many lands which never have been cultivated; but none known to Europeans, which has not been polluted with human blood. The very solitudes of the ocean gulp down into their abysses vessels filled with men, sunk to the bottom by the hands of men. ✕In cities, apparently so flourishing by arts and monuments, pride, craft, superstition, impiety, violence, and perfidy, are in a state of incessant warfare, and keep the wretched inhabitants in perpetual alarm. The more

* I do not mean to affirm, however, that America was peopled only from the islands of the South Sea. I believe that a passage was opened into it likewise by the north of Asia and of Europe. Nature always presents to mankind different means for the attainment of the same end. But the principal population of the New World came from the islands of the South Sea.

society is polished in them, the more numerous and cruel are the evils which oppress them. Is the industry of man there most exerted, only because he is there most miserable? Why should the empire of the globe have been conferred on the single animal which had not the government of its own passions? How comes it that man, feeble and transitory, should be animated by passions at once ferocious and generous, despicable and immortal? How is it that, born without instinct, he should have been able to acquire such various knowledge? He has happily imitated all the arts of Nature, except that of being happy. All the traditions of the human race have preserved the origin of these strange contradictions, but religion alone unfolds to us the cause of them. She informs us that man is of a different order from the rest of animals; that his reason perverted has given offence to the AUTHOR of the universe; that as a just punishment he has been left to the direction of his own understanding; that he is capable of forming his reason only by the study of universal reason, displayed in the works of Nature, and in the hopes which virtue inspires; that by such means alone he can be enabled to rise above the animal, beneath the level of which he is sunk, and to reascend, step by step, along the steepy declivity of the celestial mountain from which he has been precipitated.

Happy is he in these days, who, instead of rambling over the world, can live remote from mankind! Happy the man who knows nothing beyond the circumference of his own horizon, and to whom even the next village is an unknown land! He has not placed his affections on objects which he must never more behold, nor left his reputation at the mercy of the wicked. He believes that innocence resides in hamlets, honour in palaces, and virtue in temples. His glory and his religion consists in communicating happiness to those around him. If he beholds not in his garden the fruits of Asia or the shady groves of America, he cultivates the plants which delight his wife and children. He has no need of the monuments of architecture to dignify and embellish his landscape. A tree, under the shade of which a virtuous man is reclined to rest, suggests to him sublime recollections; the poplar in the forest recalls to his mind the combats of Hercules; and the foliage of the oak reminds him of the crowning garlands of the Capitol.

STUDY TWELFTH.

OF SOME MORAL LAWS OF NATURE.

WEAKNESS OF REASON; OF FEELING; PROOFS OF THE
DIVINITY, AND OF THE IMMORTALITY OF THE SOUL,
FROM FEELING.

It is one of the great calamities of human life, that in proportion as we approach the source of truth, it flies away from before us; and that when by chance we are enabled to catch some of its smaller ramifications, we are unable to remain constantly attached to them. Wherefore has the sentiment which yesterday exalted me to heaven at sight of a new relation of Nature—wherefore has it disappeared to-day? Archimedes did not remain always in an ecstasy from the discovery of the relations of metals in the crown of King Hiero. He after that made other discoveries more congenial to his mind; such as that of the cylinder circumscribed within the sphere, which he gave directions to have engraved on his tomb. Pythagoras contemplated at length with indifference the square of the hypotenuse, for the discovery of which he had vowed, it is said, a whole herdsman of oxen to Jupiter. I recollect that when I first became master of the demonstration of those sublime truths, I experienced a delight almost as lively as that of the great men who were the first inventors of them. Wherefore is it extinguished? Why do I this day stand in need of novelties to procure me pleasure? The mere animal is in this respect happier than we are; what pleased him yesterday will likewise give him pleasure to-morrow; he fixes for himself a boundary which he never exceeds; what is sufficient for him always appears to him beautiful and good. The ingenious bee constructs commodious cells, but never dreams of rearing triumphal arches, or obelisks, to decorate her waxen city. A cottage was in like manner sufficient for man, in order to be as well lodged as a bee. What need had he of five orders of architecture, of pyramids, of towers, of kiosques?

What then is the versatile faculty called *reason*, which I employ in observing Nature? It is, say the schools, a perception of correspondences which essentially distinguishes

man from the beast. Man enjoys reason, and the beast is merely governed by instinct. But if this instinct always points out to the animal what is best adapted to its situation, it is therefore likewise a reason, and a reason more precious than ours, as being invariable, and acquired without the aid of long and painful experience. To this the philosophers of the last age replied, that the proof of the want of reason in beasts is, that they act always in the same manner; thus they concluded, from the very perfection of their reason, that they had none. Hence we may see to what a degree great names, salaries, and associations, may give currency to the greatest absurdities; for the argument of these philosophers is a direct attack on the Supreme Intelligence itself, which is as invariable in its plans as animals are in their instinct. If bees uniformly construct their cells of the same figure, it is because Nature always makes bees of the same character.

I do not mean however to affirm that the reason of beasts and that of man is the same: ours is without dispute much more extensive than the instinct of each animal in particular; but if man is endowed with a universal reason, must it not be because his wants are universal? He likewise discerns, it is true, the wants of other animals; but may it not be relatively to himself that he has made this his study? If the dog gives himself no concern about the oats of the horse, it is perhaps because the horse is not subservient to the wants of the dog.

✕ We possess, notwithstanding, natural adaptations peculiar to ourselves, such as the art of agriculture and the use of fire. The knowledge of these undoubtedly would demonstrate our natural superiority, were it not also a proof of our wretchedness. Animals are under no necessity to kindle fires or to cast seed into the ground, for they are clothed and fed by the hand of Nature. Besides, many of them have faculties far superior to our sciences, which are, to say truth, foreign to us. Another mortifying insufficiency presents itself, when philosophy attempts to employ, in combating the Intelligence of Nature, that very reason which can be of no use but to discern it. What plausible arguments are detailed respecting the danger of the passions, the frivolity of human life, the loss of fortune, of honour, of children! You can easily unhouse me, divine Marcus Aurelius, and you too, skeptical Montagne; but you have not provided for me another home. ✓

You put the staff of philosophy into my hand, and say to me, Walk on intrepidly ; make the tour of the world, begging your bread ; you are just as happy as we in our villas, with our wives, and respected by all around. But here is an evil of which you had no foresight. I have received in my own country calumny only as the reward of all my services ; I have experienced nothing but ingratitude on the part of my friends, and even of my patrons ; I am solitary, and have no longer the means of subsistence ; I am a prey to nervous disorders ; I stand in need of men, but my soul is troubled at the sight of them, while I reflect on the fatal reasons by which they are united, and feel that there is no possibility of interesting them, but by flattering their passions, and by becoming as vicious as they are. What good purpose does it serve to have studied virtue ? It shudders at such recollections, and even without any reflection, merely at the sight of men. The first thing that fails me is that very reason on which you desire me to lean for support. All your fine logic vanishes precisely at the moment when I have most need of it. Death you tell me will cure every thing ; but in order to die I have no occasion for all this reasoning ; besides, I do not drop in the vigour of life into the arms of death, but dying and reasoning no longer, still however feeling and suffering.*

What is, once more, that reason, of which we boast so triumphantly ? As it is nothing more than the relation of objects to our wants, it is reduced then to mere personal interest. This sublime faculty farther undergoes, from the first moment of its expansion, a shock so violent, that it is rendered in some sort incapable of penetrating into the field of Nature. The maxims instilled into us from infancy, *Make a fortune, Be the first*, are alone sufficient to subvert our natural reason ; they exhibit to us the just and unjust only as they stand related to our personal interests and ambi-

* Thus religion has greatly the superiority over philosophy, inasmuch as she supports us not by our reason but by our resignation. She would have us not on foot and stirring about, but stretched on a bed of languishing : not on the theatre of the world, but reposing at the footstool of the Throne of God : not tormented with solicitude about futurity, but confident and composed. When books, honours, fortune, and friends forsake us, she presents us with a pillow for our head, not the recollection of our frivolous and theatrical virtues, but that of our insufficiency ; and instead of the arrogant maxims of philosophy, she demands of us only calmness, peace, and filial confidence.

tion. Good cause we then have to mistrust reason, as from the very first step it misleads us in our researches after truth and happiness. Let us inquire whether there is not in man some faculty more noble, more invariable, and of greater extent.

Descartes lays down, as the basis of the first natural truths : *I think, therefore I exist.* As this philosopher has acquired high reputation, merited besides by his knowledge in geometry, and, above all, by his virtues, his argument in proof of existence has been greatly extolled, and dignified with the title of axiom. But this argument has not the generality of a fundamental principle, for it implicitly follows, that when a man does not think, he ceases to exist, or at least to have a proof of his existence. It follows, farther, that the animal creation, to which Descartes denied the power of thought, had no proof they existed ; and that most beings are in a state of non-existence with respect to us, as they excite simple sensations merely, of forms, colours, and movements, without any reference to thought. Besides, the results of human thought having been frequently employed, from their versatility, to suggest doubts respecting the existence of God, and even of our own, as was the case with the skeptic Pyrrho, this reasoning, like all the operations of the human understanding, falls under well-grounded suspicion.

I substitute, therefore, in place of the argument of Descartes, what appears to me more simple and general : *I feel, therefore I exist.* It extends to all our physical sensations, which admonish us much more frequently of our existence than thought does. It has for its moving principle an unknown faculty of the soul, which I call *sentiment*, or mental feeling, to which thought itself must refer ; for the evidence to which we attempt to subject all the operations of our reason is itself simply sentiment.

I shall first make it appear that this mysterious faculty differs essentially from physical sensations, and from the relations presented to us by reason : it invariably blends in every thing we do ; so that it is, if I may be allowed the expression, human instinct.

As to the difference of sentiment from physical sensation, 't is evident Iphigenia at the altar gives us an impression very different from that produced by the taste of a fruit or the perfume of a flower ; and as to that which distinguishes

it from a process of the understanding, certainly the tears and despair of Clytemnestra excite in us very different emotions from those suggested by a satire, a comedy, or even, if you will, by a mathematical demonstration. Not but that reason may sometimes issue in sentiment when it presents itself with evidence ; but the one is only, with relation to the other, what the eye is with relation to the body, that is, an intellectual vision : besides, mental feeling appears to be the result of laws of Nature, as reason is of political laws.

I shall give no farther definition of this obscure principle, but state an opposition between it and reason. Women, always nearer to Nature, from their very irregularities, than men with their pretended wisdom, never confound these two faculties ; they distinguish the first by the name of sensibility, or sentiment, by way of excellence, because it is the source of our most delicious affections ; they guard against confounding, as most men do, the understanding and the heart, reason and sentiment, the one frequently our own work, the other always that of Nature. They differ so essentially from each other, that if you wish to annihilate the interest of a work which abounds in sentiment, you have only to introduce an infusion of reasoning.

Reason produces many men of intelligence in ages pretended barbarous. Reason varies from age to age, and sentiment is always the same. The errors of reason are local and changeable, but the truths of sentiment are invariable and universal. We frequently stand in need of many combinations, for the purpose of bringing to light some concealed reason of Nature ; but the simple and pure sentiments of repose, peace, or gentle melancholy, which she inspires, come to us without effort.

Reason, I grant, procures for us pleasures of a certain kind ; but if she discovers some small portion of the order of the universe, she exhibits also our own destruction attached to the laws of its preservation ; she presents at once evils past and to come ; and furnishes arms to our passions while she is demonstrating their insufficiency. The farther she carries us, the more she convinces us of our own nothingness ; and so far from soothing our pains by her researches, she frequently aggravates them bitterly by the discoveries which she makes. Sentiment, on the contrary, blind in its desires, embraces the monuments of all countries and ages ; it is soothed in the

midst of ruins, combats, and even death itself, in contemplating an indescribable eternal existence ; it pursues the attributes of Deity, infinity, extension, duration, power, grandeur, and glory ; it mingles the ardent desires of these with all our passions ; it thus communicates a certain sublime impulse ; and, by subduing our reason, itself becomes the most noble and delicious instinct of human life.

Sentiment demonstrates much better than reason the spirituality of the soul ; for reason frequently proposes as an end the gratification of our grossest passions, whereas sentiment is ever pure in its propensities. Besides, many natural effects which escape the one are under the control of the other, such as evidence itself, a mere matter of feeling, and over which reflection exercises no constraint ; such too is our own existence. The proof of it is not in the province of reason ; for why do I exist ? where is the reason of it ? But I feel that I exist, and this sentiment is sufficient to produce conviction. ~~×~~ I proceed to demonstrate that there are two powers in man, the animal and intellectual, both of an opposite nature, which by their union constitute human life, just as the harmony of every thing on earth is composed of two contraries.

~~×~~ Certain philosophers have taken pleasure in painting man as a god. His attitude they tell us is that of command. But in order to his having the air of command, others should have that of submission, without which he would find an enemy in every one of his equals. The natural empire of man extends only to animals ; and in the wars he wages with them, or in the care he exercises over them, he is frequently constrained to drop his attitude of emperor to assume that of slave.

~~×~~ Others represent man as the perpetual object of vengeance to angry Heaven, and have accumulated on his existence all the miseries which can render it odious to him. This is not painting man. He is not formed of a simple nature like animals, but of two opposite natures, each farther subdivided into several passions, which form a contrast. By one of these natures he unites in himself all the wants and passions of animals ; by the other, the ineffable sentiments of the Deity. To this last instinct, more than to his reflective powers, he is indebted for his conviction of the existence of God ; for having the faculty of perceiving the correspondences of Nature, he found out the relations between an island and a tree, a tree and a fruit, a fruit and his own wants ; he would readily feel

himself determined, on seeing an island, to look for food upon it : but his reason, in showing him the links of four natural harmonies, would not refer the cause of them to an invisible Author, unless he had the sentiment of it deeply impressed on his heart.

Considering man as an animal, I know of no one so wretched. First he is naked, exposed to insects, wind, rain, heat, cold, and laid under the necessity in all countries of finding himself clothing. If his skin acquires sufficient hardness to resist the elements, it is not till after cruel experiments, which sometimes flay him from top to toe. He knows nothing naturally as other animals do. If he wants to cross a river, he must learn to swim ; nay, he must in his infancy be taught to walk and speak.* He is obliged everywhere to prepare his food with care and trouble. Suppose him even to have collected every blessing his heart can desire, the love and pleasure which flow from abundance, avarice, thieves, the incursions of the enemy, disturb his enjoyment. He must have laws, judges, magazines, fortresses, confederacies, and regiments, to protect his ill-fated corn field. Finally, when it is in his power to enjoy with all the tranquillity of a sage, languor takes possession of his mind ; he must have comedies, balls, masquerades, amusements, to prevent him from reasoning with himself.

Reason itself, united to the passions, would only stimulate their ferocity ; for it would supply them with new arguments long after their desires were gratified. It is in most men nothing more than the relation between beings and their wants, that is their personal interest. Let us examine the effect of it, combined with love and ambition, the two tyrants of human life.

Suppose a state entirely governed by love, I beg leave to ask, Who would be at the trouble of building houses there,* and of labouring the ground ? Must not such a country contain servants whose industry should compensate the idleness of their masters ? Will not those servants be obliged to abstain from making love, that their masters may be employed in it ? Besides, how are the old people to pass their time ? A fine spectacle for them truly, to behold their children always indulging in the dalliance of the tender passion !

* The very name of infant is derived from the Latin word *infans*, that is to say, one who cannot speak.

Would not such a spectacle produce regret, ill-humour, jealousy, as in our country? Such a government in truth, even in the islands of the South Sea, under groves of the cocoa and bread-fruit trees, where there was nothing to do but to eat and make love, would soon be torn by discord and oppressed with languor.

If, on the other hand, a nation were under the dominion of ambition solely, it would come still sooner to destruction, either from external enemies or its own citizens. How could it be reduced to form under one legislator, or how can we conceive the possibility of ambitious men voluntarily submitting to another man? Those who have united them, as Romulus, Mahomet, and all founders of nations, have commanded attention and obedience only by speaking in the name of the DEITY. But supposing this union accomplished, could such an association ever be happy? Let historians extol conquering Rome ever so highly, is it credible that her citizens then deserved the appellation of fortunate? What, while they were devastating the globe, and causing floods of tears to flow, were there at Rome no hearts oppressed with terror, no eye overflowing for the loss of a son, father, husband, or lover? Were the slaves, the greatest part of her inhabitants, happy? Was the Roman general himself happy, crowned with laurels and mounted on a triumphal car, around which, by a military law, his soldiers were singing songs in which his faults were exposed, to prevent his waxing proud and forgetting himself?

This very people, however, so disposed to pursue their own glory through the calamity of others, were obliged, in order to dissemble the horror of it, to veil the tears of the nations with the interest of the gods, as we disguise with fire the flesh of the animals which is to serve for food. Rome, following the order of destiny, was to become at length the capital of the world. She armed her ambition with a *celestial reason*, to render her victorious over powers the most formidable, and to curb the ferocity of her own citizens by inuring them to the practice of sublime virtue. What would they have become had they given themselves up without restraint to that furious instinct? They would have resembled the savages of America, who burn their enemies alive, and devour the flesh still streaming with blood. This Rome at last experienced, when her religion presented no longer any

thing to her enlightened inhabitants except unmeaning imagery. Then were seen the two passions natural to the heart of man, ambition and love, inviting to a residence within her walls the luxury of Asia, the corruptive arts of Greece, proscriptions, murders, poisonings, conflagrations, and giving her up a prey to barbarous nations. The Theutates of the Gauls then issuing from the forests of the north, and arriving at the Capitol, made the Roman Jupiter tremble in his turn.

Our *reasons of state* are in modern times less sublime, but no less fatal to the repose of mankind. A nation delivered up to its passions, and to simple *reasons of state*, would speedily incur all the miseries incident to humanity; but Providence has implanted in the breast of man a sentiment to counterbalance the weight of these, by directing his desires far beyond this world; I mean the sentiment of the existence of the DEITY. Man is not man because he is a reasonable, but a religious animal.

Cicero and Plutarch have remarked, that, up to their time, not a single people was known among whom no traces of religion were to be found. The sentiment of DEITY is natural to man. It is that illumination which St. John denominates 'the true light, which lighteth every man that cometh into the world.' I condemn certain modern authors, some even missionaries, for having asserted that certain nations were destitute of all sense of the DEITY. This is the blackest of calumnies with which a nation can be branded, because it entirely strips them of the existence of every virtue; and if such a nation betrays any appearance of virtue, it can only be under the impulse of hypocrisy; for there can be no virtue distinct from religion. Those writers however furnish the means of refuting this imputation, by acknowledging that these very atheistical nations on certain days present homage to the moon, or retire into the woods to perform certain ceremonies, carefully concealed from strangers, but which clearly demonstrate they have ideas of the DEITY.

All nations have the sentiment of the existence of God; not that they all raise themselves to Him after the manner of a Newton and a Socrates, in contemplation of the general harmony of his works, but by dwelling on those of his benefits which interest them the most. The Indian of Peru worships the sun; he of Bengal, the Ganges, which fertilizes his plains; the black Iolof, the ocean, which cools his

shores ; the Samoiede of the north, the rein-deer which feeds him. The wandering Iroquois demands of the spirits which preside over the lakes and forests plentiful fishing and hunting seasons. Many worship their kings ; but all nations, to endear to men those august dispensers of their felicity, have called in the aid of some divinity to consecrate their origin. Such are in general the gods of the nations ; but when the passions interpose, and darken this divine instinct, and blend with it either the madness of ambition, or the seduction of voluptuousness, you behold them prostrating themselves before serpents, crocodiles, and other gods too abominable to be mentioned. You behold them offering in sacrifice the blood of their enemies and the virginity of their daughters. The character of a people and its religion are the same. Man feels this celestial impulse so irresistibly, that on ceasing to take the DEITY for his model, he never fails to make one after his own image.

There are therefore two powers in man, the animal and divine. The first presents the sentiment of his wretchedness, the second that of his own excellence ; and from their conflicts are produced the varieties and contradictions of human life.

By the sentiment of our wretchedness we become alive to every idea of asylum and protection, of ease and accommodation. Hence most men cherish the thought of calm retreats, of abundance, and all the blessings which bountiful Nature has provided on the earth to supply our wants. This sentiment gave to Love the chains of Hymen, that man might one day find the companion of his pains in that of his pleasures, and that children might be ensured of the assistance of their parents. This sentiment frequently mingles with the moral affections ; it looks for support in friendship, and for encouragement in commendation. It renders us attentive to the promises of the ambitious man, and eager to follow him like slaves, seduced by the ideas of protection with which he amuses us. Thus the sentiment of our wretchedness is one of the most powerful bonds of political society, though it attaches us to the earth.

The sentiment of Deity impels us in a contrary direction.*

* Whenever any one has lost this first of harmonies, all the others follow it. Does it not well deserve to be remarked, that all the writings of atheists are insufferably dry and uninteresting ? They sometimes fill you with astonishment, but never touch the heart ; they exhibit caricatures only, or gigantic ideas ; they are totally destitute of order, of proportion, and of sensibility.

This conducted Love to the altar, and dictated to the lips of the lover the first vows of fidelity : this devoted the first children to Heaven before political law existed ; rendered love sublime and friendship generous ; with one hand it succoured the miserable, and opposed the other to tyrants ; it became the moving principle of generosity and of virtue. Satisfied with the consciousness of having deserved well of mankind, it nobly disdained the recompense of applause.

When these two sentiments cross each other, that is, when we attach divine instinct to perishable objects, and the animal to things divine, our life becomes agitated by contradictory passions ; hence those frivolous hopes and fears with which men are tormented. My fortune is made, says one, I have enough to last me *for ever* ; and to-morrow he drops into the grave. How wretched am I ! says another, I am undone *for ever* ; and death is at the door to deliver him from all his woes. We are bound down to life, said Montagne, by the merest toys, by a glass ; yes, and wherefore ? Because the sentiment of immortality is impressed on that glass. If life and death frequently appear insupportable to men, it is because they associate the sentiment of their end with that of death, and the sentiment of infinity with that of life. Mortals, if you wish to live happy, and die in composure, let not your laws offer violence to those of Nature. Consider that at death all the troubles of the animal come to a period ; that all the enjoyments of a moral being commence ; the rewards of virtue, undervalued perhaps or despised by the world, but which approximate us while on the earth to a Being righteous and eternal.

When these two instincts unite, they confer upon us the highest pleasure of which our nature is susceptible ; for in them our two natures, if I may so express myself, enjoy at once. We now proceed to trace the instinct of Divinity in our physical sensations, by attempting to convey a faint idea of the nature of man.

OF PHYSICAL SENSATIONS.

✕ The physical sensations are all testimonies of our misery. Man is so sensible to the pleasure of the touch, because he is naked ; to clothe himself, he must strip the quadruped, plant, and worm. If from vegetables and animals he is supplied with food, he is obliged to employ a great deal of

cookery, and many combinations, in preparing his aliments. Nature has treated him with severity, for he is the only animal for whose wants she has made no immediate provision. Our philosophers have not sufficiently studied this perplexing distinction. How! a worm provided with its auger or file; the insect enters into life in the midst of a profusion of fruit proper for his subsistence; he by and by finds in himself the means of spinning and weaving his own garment; then he transforms himself into a gaudy butterfly, and ranges uncontrolled, abandoning himself to all the delights of love, and perpetuating his species without anxiety or remorse; whereas the son of a king is born completely naked, amidst tears and groans, standing in need all his life long of the assistance of another; under the necessity of maintaining an unremitting conflict with his own species, and frequently finding in himself his most formidable enemy! Of a truth, unless we are all only children of dust, it would be a thousand times better to enter upon existence under the form of an insect, than that of an emperor. But man has been abandoned to the most abject misery only that he may have uninterrupted recourse to the first of powers.

Of the Sense of Tasting.

There is no one physical sensation but what awakens in man some sentiment of the DEITY.

To begin with the grossest of all our senses, that of eating and drinking: all nations, in the savage state, believe the DIVINITY had need to support life by the same means that men do; hence the origin of sacrifice. Hence also has proceeded in many nations the custom of placing viands on the tombs of the dead. The wives of the American savages extend this mark of solicitude even to infants who die upon the breast. After having bestowed upon them the rite of sepulture, they come once a day for several weeks, and press from the nipple a few drops of milk upon the grave of the suckling. This is positively affirmed by the Jesuit Charlevoix, who was frequently an eye-witness of the fact. Thus the sentiment of DEITY, and that of the immortality of the soul, are interwoven with our affections the most completely animal, and especially with maternal tenderness.

But man, not satisfied with admitting intellectual beings to a share of his repast, has elevated himself to their rank, by

the physical effects of those very aliments. Savage nations have been discovered who scarcely possessed industry to procure food, but not one who had not invented the means of getting drunk. Man is the only animal sensible of that pleasure. Other animals are content to remain in their sphere : man is making perpetual efforts to get out of his. Intoxication elevates the mind. All religious festivals among savages, and even polished nations, end in feasting, in which men drink till reason is gone : they begin it is true with fasting, but intoxication closes the scene. Man renounces human reason that he may excite in himself emotions that are divine. The effect of intoxication is to convey the soul into the bosom of some deity. You always hear topers celebrating in their songs Bacchus, Mars, Venus, or the God of Love. It is remarkable that men do not abandon themselves to blasphemy till they arrive at a state of intoxication ; for it is an instinct as common to the soul to cleave to the Deity when in its natural state, as to abjure him when corrupted by vice.

Of the Sense of Smelling.

The pleasures of smell are peculiar to man ; for I do not comprehend under it the olfactory emanations by which he forms a judgment of his aliments, common to him with most animals. Man alone is sensible to perfumes, and employs them to give energy to his passions. Mahomet said that this elevated his soul to Heaven. Whatever may be in this, the use of them has been introduced into the religious ceremonies and political assemblies of many nations. The Brazilians, and the savages of North America, never deliberate on any object of importance without smoking tobacco in a calumet. The habit of using tobacco has now become so powerful, that a person who has acquired it will rather forego bread for a day than his tobacco. The plant is nevertheless a real poison ; it affects at length the olfactory nerves and sometimes the sight. But man is disposed to impair his physical constitution, provided he can strengthen in himself the intellectual sentiment.

Of the Sense of Seeing.

What has been said in detailing certain general laws of Nature, harmonies, conformities, contrasts, and oppositions, refers principally to the sense of seeing. I do not speak of

adaptation or correspondence ; this belongs to the sentiment of reason, and is entirely distinct from matter. The other relations are in truth founded on the reason itself of Nature, which communicates delight by means of colours and forms generative and generated, and inspires melancholy by those which announce decomposition and destruction. But without entering upon that vast and inexhaustible subject, I shall at present confine myself to certain optical effects, which involuntarily excite in us the sentiment of some of the attributes of Deity.

One of the most obvious causes of the pleasure we derive from the sight of a great tree, arises from the sentiment of infinity kindled in us by its pyramidical form. The decrease of its different tiers of branches and tints of verdure, always lighter at the extremities of the tree than in the rest of its foliage, give it an apparent interminable elevation. We experience the same sensations in the horizontal plan of landscapes, in which we frequently perceive successive hilly elevations flying off one behind another till the last melt away into the heavens. Nature produces the same effect in vast plains by means of the vapours which rise from the banks of the lakes, or channels of the brooks and rivers that wander through them ; their contours are multiplied in proportion to the extent of the plain ; they present themselves on different plans ; sometimes they stand still, like curtains drawn along the skirts of the forests ; sometimes they mount into columns over the brooks of the meadows ; sometimes they are quite gray, at others illuminated and penetrated by the rays of the sun. Under all these aspects, they display, if I may use the expression, several perspectives of infinity in infinity itself.

I say nothing of the delightful spectacle the heavens sometimes present in the disposition of the clouds. I do not know of any philosopher who has even suspected their beauties were subjected to law. It is certain, however, that no animal which lives in the light is insensible to their effects ; but the harmonies of heaven are to be felt only by the heart of man. All nations, struck by their ineffable language, raise their hands and eyes to heaven in the involuntary motions of joy or grief.

Reason, however, tells them God is everywhere. How comes it that no one stretches out his arms towards the earth or the horizon in the attitude of invocation ? Whence comes

the sentiment which whispers to them, *God is in heaven?* Is it because heaven is the place where light dwells? Is it because the light itself which discloses all objects to us, not being like our terrestrial substances, liable to be divided, corrupted, destroyed, and confined, seems to present something celestial in its substance? It is to the sentiment of infinity which the sight of the heavens inspires, that we must ascribe the taste of all nations for building temples on the summit of a mountain, and the invincible propensity the Jews felt to worship upon high places. There is not a mountain on the islands of the Archipelago but what has its church, nor a hill in China without its pagoda. If, as some philosophers pretend, we never form a judgment of the nature of things but from the mechanical results of a comparison with ourselves, the elevation of mountains ought to humiliate our insignificance. But the truth is, these sublime objects, by elevating us towards heaven, direct thither the soul of man by the sentiment of infinity; and disjoining us from things terrestrial, waft us to the enjoyment of beauties of much longer duration.

× The works of Nature frequently present several kinds of infinity at once: thus, for example, a great tree, with a trunk cavernous and covered with moss, conveys the sentiment of infinity as to time and elevation; it exhibits a monument of ages past. If to this is added infinity of extension, as when we perceive through its solemn branches objects prodigiously remote, our veneration increases. Go on, and add to these the different ridges of its mass, in contrast with the profundity of the valleys and level of the plains; its venerable half-lights, which play with the azure of the heavens; and the sentiment of our own wretchedness, which it relieves by ideas of the protection it affords in the thickness of its trunk and in its august summit agitated by the winds, the majestic murmurs of which seem to sympathize with our distress: a tree, with all these harmonies, seems to inspire an inexpressible religious awe. Pliny, in conformity to this idea, says, trees were the first temples of the gods.

The sublime impression they produce becomes still more profound when they recall some sentiment of virtue, as the recollection of those who planted them, or whose tombs they shade. It is from an effect of this sentiment that the mountains of Greece and Italy appear more respectable than those

of the rest of Europe, though of no higher antiquity, because their monuments, in ruins as they are, call to mind the virtues of the persons who inhabited them.

In general, the different sensations of infinity increase by the contrasts of the physical objects which produce them. Our painters would give a powerful effect to their back-ground scenery, if they opposed to it the frontispiece, not only in colours and forms, as they sometimes do, but in nature. The great art of moving is to oppose sensible objects to intellectual. The soul there takes a daring flight. It soars from the visible to the invisible, and enjoys, if I may be allowed the expression, in its own way, by extending itself into the unbounded fields of sentiment and of intelligence. Among certain Tartar tribes, when a great man dies, his groom after the interment leads out the horse which his master was accustomed to ride, places the clothes which he wore on the horse's back, and walks him, in profound silence, before the assembly, who by that spectacle are melted into tears.

In all scenes of passion, where the intention is to produce strong emotions, the more the principal object is circumscribed, the more extended is the intellectual sentiment resulting from it. Such is the nature of the human soul ; so far from being material, it lays hold only of correspondences. The less you display to it physical objects, the more you awaken in it intellectual feelings.

Of the Sense of Hearing.

Plato calls hearing and seeing the senses of the soul. I suppose he qualifies them particularly by this name, because vision is affected by light, which is not properly speaking a substance ; and hearing by the modulations of the air, which are not of themselves bodies. Besides, these two senses convey only the sentiment of correspondences and harmonies, without involving us in matter, as smelling does, which is affected only by the emanations from bodies ; tasting by their fluidity ; and touching by their solidity, softness, heat, and other physical qualities. Though hearing and seeing be the direct senses of the soul, we ought not, however, thence to conclude that a man born deaf and blind must be an idiot. The soul sees and hears by all the senses.

The sense of hearing is the immediate organ of intelligence : it is adapted to the reception of speech, a faculty peculiar to

man, which, by its infinite modulations, is the expression of all the correspondences of Nature and feelings of the human heart. But there is another language appertaining still more particularly to this first principle of ourselves, to which we have given the name of *sentiment* : I mean music.

This science possesses the incomprehensible power of rousing and quieting the passions, in a manner independent of reason ; and of kindling sublime affections disengaged from all intellectual perception. It is so natural to man, that the first prayers addressed to the DEITY, and the original laws among all nations, were set to music. Man loses a taste for it only in polished society, the very languages of which at length lose their accentuation. (The fact is, that a multitude of social relations destroy in a state of refinement the correspondences of Nature. In that state we reason much, but scarcely feel any longer.)

✕The AUTHOR of Nature has deemed the harmony of sounds to be so necessary to man, that every situation upon the earth has its singing bird, and all over the globe they discover an instinct which attracts them to the habitation of man. If there be but a single hut in a forest, all the song-birds of the vicinity come and settle round it. Nay, none are to be found except in places which are inhabited.

The melodies of song-birds have similar relations to the sites they occupy, and even to the distances which they live from our habitations. The lark, who nestles among our corn, and delights in soaring perpendicularly till we lose sight of him, makes his voice to be heard in the air when no longer perceptible to the eye. The swallow, who grazes the walls of our houses as he flies, and reposes on our chimneys, has a small gentle chirping voice, which does not stun the ear, as that of the songsters of the grove would do ; but the solitary nightingale makes himself heard at the distance of more than half a league. He mistrusts the vicinity of man ; nevertheless always places himself within the reach of his ear. He chooses, for this effect, places which are the best conductors of sound, that their echoing may give more action to his voice. (Having stationed himself in his orchestra, he warbles an unknown drama, which has its exordium, exposition, recitative, and catastrophe, intermingled sometimes with the most extravagant bursts of joy, sometimes with bitter and plaintive notes of recollection, expressed by long and deep

sighs. He raises his song at the commencement of that season which renews the face of Nature, and seems to present man with a representation of the restless career which lies before him. Δ

Δ Every bird has a voice adapted to the times and stations of its destination, and relative to the wants of man. Δ The loud clarion of the cock calls him up to labour at the dawn of day. The brisk and lively song of the lark invites the swains and shepherdesses to the dance; the voracious thrush, which appears only in autumn, summons the rustic vine-dresser to the vintage. Man alone is attentive to the accents of the feathered race. Never will the deer, who sheds tears copiously over his own misfortunes, sigh over those of the complaining Philomel. Never did the laborious ox, when led to the slaughter after all his painful services, turn his eyes toward her, and say: 'Solitary bird, behold in what manner man rewards his servants!'

X Nature has diffused these distractions and consonances of fortune over volatile beings, that our soul, susceptible of every wo, finding occasions of extending that susceptibility, might be enabled to alleviate the pressure. She has rendered insensible bodies themselves capable of these communications. She presents frequently, in scenes which pain the eye, others which delight the ear, and sooth the mind with interesting recollections. Thus from the bosom of forests she transports us to the brink of waters, by the rustling of the aspens and poplars. At other times she conveys, when we are by the side of the brook, the noise of the sea, and manœuvres of navigation, in the murmuring of reeds shaken by the wind. When she can no longer seduce our reason by foreign imagery, she lulls it to rest by the charm of sentiment: she calls forth from the bosom of the forests, meadows, and valleys, sounds ineffable, which excite pleasing reveries, and plunge us into profound sleep.

Of the Sense of Touching.

I shall make but few reflections on the sense of touching. It is the most obtuse of all our senses, and nevertheless is in some sort the seal of our intelligence. To no purpose is an object exposed to the examination of the eye, in every possible position; we cannot be persuaded that we know it, unless we are permitted to put it to the touch. This instinct pro-

ceeds, perhaps, from our weakness, which seeks in those approximations points of protection. The sense in question, however, blunt as it is, may be made to communicate intelligence, as is evident from the example adduced by Chardin, of the blind men of Persia, who traced geometrical figures with their fingers, and formed a very accurate judgment of the goodness of a watch by handling the parts of the movement.

Wise Nature has placed the principal organs of this sense, diffused over the whole surface of our skin, in our hands and feet, members the best adapted to judge of the quality of bodies. But that they might not lose their sensibility by frequent shocks, she has bestowed on them a great degree of pliancy, by dividing them into several fingers and toes, and these again into several joints; farther, she has furnished them, on the points of contact, with elastic half-pincers, which present at once resistance in their callous and prominent parts, and an exquisite sensibility in the retreating.

It astonishes me, however, that Nature should have diffused the sense of touching over the whole human body, thence exposed to variety of suffering, while no considerable benefit seems to result from it. Man is the only animal laid under the necessity of clothing himself. Some insects, indeed, make cases for themselves, as the moth; but they are produced in places where their clothing is, if I may say so, ready made. This necessity, become an inexhaustible source of human vanity, is one of the most humiliating proofs of our wretchedness. Man alone is ashamed of appearing naked. This is a feeling of which I do not discern the reason in Nature, nor the similitude in the instinct of other animals. Besides, independently of all sense of shame, he is constrained by powerful necessity to clothe himself in every variety of climate.

✕ It is, I believe, on account of the troublesomeness of the flies common and very necessary in the marshy and humid places of hot countries, that Nature has placed but few quadrupeds with hair on their shores, but quadrupeds with scales, upon which the flies have not the means of fastening. It is, perhaps, also for this reason that hogs and wild boars, which frequent such places, are furnished with hair, long, stiff, and bristly, which keep volatile insects at a distance. Nature has not employed, in this respect, any one precaution in

behalf of man. Of a truth, on contemplating the beauty of his form, and complete nakedness, it is impossible not to admit the ancient tradition of our origin. Nature, in placing him on the earth, said to him : 'Go, degraded creature, animal destitute of clothing, intelligence without light ; go and provide for thy own wants ; it shall not be in thy power to enlighten thy blinded reason, but by directing it continually towards heaven, nor to sustain thy miserable life without the assistance of beings like thyself.' And thus out of the misery of man sprung up the two commandments of the law.

OF THE SENTIMENTS OF THE SOUL.

Mental Affections.

I shall speak of mental affections chiefly to distinguish them from the sentiments of the soul ; for example, the pleasure comedy bestows is widely different from that of which tragedy is the source. The emotion which excites laughter is an affection of the mind, or of human reason ; that which dissolves us into tears is a sentiment of the soul. Not that I would make of the mind and soul two powers of a different nature ; but it seems that the one is to the other what sight is to the body ; mind is a faculty, soul the principle of it : the soul is as it were the body of our intelligence. I consider the mind as an intellectual eye, to which may be referred the other faculties of the understanding, as the *imagination*, which apprehends things future ; *memory*, which contemplates those that are past ; and *judgment*, which discerns their correspondences. The impression of these different acts of vision sometimes excites in us a sentiment denominated *evidence* ; and in that case this last perception belongs immediately to the soul, as it sometimes excites in us a delicious emotion ; but, raised to that, it is no longer in the province of mind ; because when we begin to feel we cease to reason ; it is no longer vision, it is employment.

As our education and manners direct us toward our personal interest, hence the mind employs itself only about social conformities, and that reason, after all, is but the interest of our passions ; but the soul, left to itself, pursues the conformities of Nature and our sentiment is always the interest of mankind.

Thus, I repeat it, mind is the perception of the laws of

society, sentiment that of the laws of Nature. Those who display the conformities of society, as comic writers, satirists, epigrammatists, and even the greatest moralists, are men of wit. Those who discover the conformities of Nature, as tragic and other poets of sensibility, the inventors of arts, great philosophers, are men of genius. The first class belong to one age, season, nation, or junto; the others to posterity and mankind.

We shall be still more sensible of the difference between mind and soul, by tracing their affections in opposite progresses. Whenever the perceptions of the mind are carried up to evidence, they are exalted into a source of exquisite pleasure, independently of every particular relation of interest; because they awaken a feeling within us. But when we analyse our feelings, and refer them to the examination of the mind, or reasoning power, these sublime emotions vanish; for we then refer them to some accommodation of society, fortune, system, or some other personal interest, whereof our reason is composed. Thus, in the first case, we change our copper into gold; and in the second, our gold into copper.

✕Again, nothing can be less adapted ultimately to the study of Nature, than the reasoning powers of man; for though they may catch here and there some natural conformities, they never pursue the chain to any great length: besides, there is a much greater number which the mind does not perceive, because it always brings back every thing to itself, and to the little social or scientific order within which it is circumscribed. As it refers every thing to its own reason, and seeing no reason for existence but on earth, it then concludes that in fact it shall not in that case exist. To be consistent, it ought equally to conclude that it does not exist now; for it certainly can discover neither in itself nor in any thing around an actual reason for its existence.

We are convinced of our existence by a power greatly superior to our mind, which is sentiment, or intellectual feeling. We shall carry this natural instinct with us into our researches respecting the existence of the DEITY, and the immortality of the soul; subjects on which our versatile reason has so frequently engaged, sometimes on this, sometimes on the other side of the question. Though our insufficiency be too great to admit of launching far into this unbounded

career, we presume to hope that our perceptions, nay, our very mistakes, may encourage men of genius to enter upon it. These sublime and eternal truths seem so deeply impressed on the human heart, as to become the principles of our intellectual feeling, and to manifest themselves in our most ordinary affections, as in the wildest excesses of our passions.

Innocence.

The sentiment of innocence exalts us towards the DEITY, and prompts us to virtuous deeds. The Greeks and Romans employed little children to sing in their religious festivals, and to present their offerings at the altar, in the view of rendering the gods propitious to their country by the spectacle of infant innocence. The sight of infancy calls men back to the sentiments of Nature. When Cato of Utica resolved to put himself to death, his friends concealed his sword; and upon his demanding it with expressions of violent indignation, they delivered it by the hand of a child: but the corruption of the age had stifled in his heart the sentiment which innocence ought to have excited.

Pity.

The sentiment of innocence is the native source of compassion; hence we are more deeply affected by the sufferings of a child than by those of an old man. The reason is not, as certain philosophers pretend, because the resources and hopes of the child are inferior; for they are in truth greater than those of the old man, frequently infirm, and hastening to dissolution, whereas the child is entering into life; but the latter has never offended; he is innocent. This sentiment extends even to animals, which in many cases excite our sympathy more than rational creatures do, from this very consideration, that they are harmless.

Thus the sentiment of innocence develops, in the heart of man, a divine character, that of generosity. It bears not on the calamity abstractedly considered, but on a moral quality, which it discerns in the unfortunate being who is the object of it. It derives increase from the view of innocence, and sometimes still more from that of repentance. Man alone is susceptible of it; not by a secret retrospect of himself, as some enemies of the human race have pretended; for were that the case, on stating a comparison between a child and an old

man, both unfortunate, we ought to be more affected by the misery of the old man, considering we are removing from the wretchedness of childhood, and drawing nearer to that of old age: the contrary, however, takes place, in virtue of the moral sentiment which I have alleged.

When an old man is virtuous, the moral sentiment of his distress is excited with redoubled force; a proof that pity in man is by no means an animal affection. The sentiment of innocence is a ray of the Divinity. It invests the unfortunate person with a celestial radiance which falls on the human heart, and recoils, kindling it with generosity, that other flame of divine original. It alone renders us sensible to the distress of virtue, by representing it as incapable of doing harm; for otherwise we might be induced to consider it as sufficient for itself. In this case it would excite rather admiration than pity.

Love of Country.

This sentiment is still farther the source of love of country, because it brings to recollection the gentle and pure affections of our earlier years. It increases with extension, and expands with time, as a sentiment of a celestial and immortal nature. They have in Switzerland an ancient and simple musical air, called the *rans des vaches*. The music of this air produces an effect so powerful, that the playing of it was prohibited in Holland and France before the Swiss soldiers, whom it caused to desert. I imagined that the *rans des vaches* must imitate the lowing and bleating of the cattle, the repercussion of the echoes, and other associations, which made the blood boil in the veins of those poor soldiers, by recalling to their memory the valleys, lakes, and mountains of their country,* the companions of their early life, their first loves, the recollection of their indulgent grandfathers, and the like.

The love of country strengthens in proportion as it is innocent and unhappy. For this reason savages are fonder of their country than polished nations; and those who inhabit

* I have been told that Pontaveri, the Indian of Otaheite, who was some years ago brought to Paris, on seeing, in the royal garden, the paper-mulberry-tree, the bark of which is in that island manufactured into cloth, he exclaimed: *Ah! tree of my country!* Though physical sensations attach us so strongly to country, moral sentiments alone can give them a vehement intensity. Time, which blunts the former, gives only a keener edge to the latter.

regions rough and wild, than those who live in fertile countries and fine climates. Never could the court of Russia prevail on a single Samoiède to leave the shores of the frozen ocean, and settle at Petersburg. Some Greenlanders were brought in the course of the last century to Copenhagen, where they were most kindly entertained, but soon fretted themselves to death. Several were drowned in attempting to return home in an open boat. They beheld the magnificence of the court of Denmark with extreme indifference; but there was one in particular who wept whenever he saw a woman with a child in her arms; hence it was conjectured this unfortunate man was a father. The gentleness of domestic education, undoubtedly, thus attaches those poor people to the place of their birth.

✕ In nations whose infancy is rendered miserable, and corrupted by irksome, ferocious, and unnatural education, there is no more love of country than of innocence. This is one cause why so many Europeans ramble over the world, and accounts for our having so few modern monuments in Europe, because the next generation never fails to destroy the monuments of that which preceded it. Hence our books, fashions, customs, ceremonies, and languages, become obsolete so soon, and are entirely different in this age from what they were in the last; whereas all these particulars continue the same among the sedentary nations of Asia for a long series of ages together; because children brought up in Asia, in the habitations of their parents, and treated with much gentleness, remain attached to the establishments of their ancestors out of gratitude to their memory, and to the places of their birth, from the recollection of their happiness and innocence.

OF THE SENTIMENT OF ADMIRATION.

The sentiment of admiration transports us immediately into the bosom of DEITY. If it is excited by an object inspiring delight, we convey ourselves thither as to the source of joy; if terror is roused, we flee thither for refuge. In either case, admiration exclaims in these words, Ah, my God! This, we are told, is the effect of education merely, in the course of which frequent mention is made of the name of God; but mention is still more frequently made of our father, of the king, of a protector, of a celebrated literary character. How comes it, then, that when we feel ourselves

standing in need of support, in such unexpected concussions, we never exclaim, Ah, my king! or, if science were concerned, Ah, Newton!

If the name of God be frequently mentioned in the progress of our education, the idea is quickly effaced in affairs of this world; why then have we recourse to it in extraordinary emergencies? This sentiment of Nature is common to all nations, many of whom give no theological instruction to their children. The inhabitants of all countries, under extraordinary emotions of surprise or admiration, make, in their own language, the same exclamation which we do, and lift up their eyes and hands to Heaven.

Of the Marvellous.

The sentiment of admiration is the source of the instinct which men have in every age discovered for the marvellous. We seek it continually, and diffuse it principally over the commencement and close of human life; hence the cradles and tombs of so great a part of mankind have been enveloped in fiction. It is the perennial source of our curiosity; it discloses itself from early infancy, and is long the companion of innocence. Whence could children derive the taste for the marvellous? They must have fairy tales; and men must have epic poems and operas. The marvellous constitutes one grand charm of the antique statues of Greece and Rome, representing heroes or gods, and contributes to our delight in the perusal of the ancient history of those countries. There is a marvellous in the religion of the ancients which consoles and elevates human nature, whereas that of the Gauls terrifies and debases it. The Greek and Roman gods were patriots, like their great men. Minerva had given them the olive, Neptune the horse; deities who protected the city and the people. But those of the ancient Gauls were tyrants, like their barons, and afforded protection only to the Druids. They must be glutted with human sacrifices.

As admiration is an involuntary movement of the soul towards Deity, consequently sublime, several modern authors have strained to multiply this kind of beauty in their productions, by an accumulation of surprising incidents; but Nature employs them sparingly in hers, because man is incapable of frequently undergoing concussions so violent. She discloses by little and little the light of the sun, the expansion of

flowers, the formation of fruits. She gradually introduces our enjoyments by a long series of harmonies ; she treats us as human beings ; that is, as machines feeble and easily deranged ; she veils Deity from our view that we may be able to support his approach.

The Pleasure of Mystery.

This is the reason that mystery possesses so many charms. Pictures placed in the full glare of light, avenues in straight lines, roses fully blown, women in gaudy apparel, are far from being the objects which please us most. But shady valleys, paths winding through the forests, flowers scarcely half opened, and timid shepherdesses, excite the sweetest and most lasting emotions. The loveliness and respectability of objects are increased by their mysteriousness. Sometimes by antiquity, which renders monuments venerable ; sometimes by distance, which diffuses charms over objects in the horizon ; sometimes by names. Hence the sciences retaining Greek names, though they frequently denote only the most ordinary things, impose more respect than those with only modern ones, though these may be more ingenious and useful. The construction of ships, and the art of navigation, for example, are more lightly prized by our modern *literati*, than other physical sciences of the most frivolous nature, but dignified by Greek names. Admiration, accordingly, is not a relation of the understanding, or a perception of reason, but a sentiment of the soul, arising from a certain undescribable instinct of Deity, at sight of extraordinary and mysterious objects. This is so indubitably certain, that admiration is destroyed by the science which enlightens us. If I exhibit to a savage an eolipe darting out of a stream of inflamed spirit of wine, I throw him into an ecstasy of admiration ; he feels himself disposed to fall down and worship the machine ; he venerates me as the god of fire, as long as he comprehends it not ; but no sooner do I explain the nature of the process, than his admiration ceases, and he looks upon me as a cheat.

The Pleasures of Ignorance.

From an effect of these ineffable sentiments and universal instincts of Deity, ignorance is become the inexhaustible source of delight to man. We must not confound, as all

our moralists do, ignorance and error. Ignorance is the work of Nature, and often a blessing to man; whereas error is frequently the fruit of our pretended sciences, and always an evil. Let political writers boast of our wonderful progress in knowledge, and oppose to it the barbarism of past ages; it was not ignorance which then set all Europe on fire, and inundated it with blood, in settling religious disputations. A race of ignorants would have been quiet; the mischief was done by persons under the power of error, who then vaunted their superior illumination, as we now do ours, and into whom the European spirit of education had instilled this error of early infancy, Be the First.)

How many evils does ignorance conceal, which we are doomed to encounter in the course of human life, beyond the possibility of escaping; the inconstancy of friends, the revolutions of fortune, calumnies, and the hour of death itself, so tremendous to most men. The knowledge of ills like these would mar all the comfort of living. How many blessings does ignorance render sublime! the illusions of friendship, and of love, the perspectives of hope, and the very treasures which science unfolds. The sciences inspire delight only when we enter upon the study of them, at the period when the mind, in a state of ignorance, plunges into the great career. The point of contact between light and darkness presents to the eye the most favourable state of vision: the harmonic point of admiration is when we begin to see clearly; but it lasts only an instant. It vanishes together with ignorance. The elements of geometry may have impassioned young minds, but never the aged, unless in certain illustrious mathematicians who proceeded from discovery to discovery. Those sciences and passions only, subjected to doubt and chance, form enthusiasts at every age of life, as chymistry, avarice, play, and love.

For one pleasure science bestows, and causes to perish in the bestowing, ignorance presents a thousand which flatter us infinitely more. You demonstrate to me that the sun is a fixed globe, the attraction of which gives to the planets one half of their movements. Had they who believed it to be conducted round the world by Apollo an idea less sublime? They imagined at least that the attention of a God pervaded the earth, together with the rays of the orb of day. It is Science which has dragged down the chaste Diana from her

nocturnal car : she has banished the Hamadryads from the antique forests, and the gentle Naiads from the fountains. Ignorance had invited the gods to partake of its joys and its woes ; to man's wedding, and to his grave : Science discerns nothing in either, except the elements merely. She has abandoned man to man, and thrown him upon the earth as into a desert.

✓ It is not to the illumination of science the Deity communicates the most profound sentiment of his attributes, but to our ignorance. Night conveys to the mind a much grander idea of infinity than all the glare of day. In the daytime I see but one sun ; during the night I discern thousands. The sun discovers only a terrestrial infinity, the night discloses an infinity altogether celestial. O, mysterious ignorance, draw thy hallowed curtain over those enchanting spectacles ! Permit not human science to apply to them its cheerless compasses. Let not virtue be reduced henceforth to look for her reward from the justice and the sensibility of a globe ! Permit her to think that there are, in the universe, destinies far different from those which fill up the measure of wo upon this earth.

Science is continually showing us the boundary of our reason, and ignorance is for ever removing it. In my solitary rambles I do not ask the name and quality of the person who owns the distant castle ; the history of the master frequently disfigures that of the landscape. It is not so with the history of Nature ; the more her works are studied the more is our admiration excited. The knowledge of the works of men is agreeable only when the monument we contemplate has been the abode of goodness. What little spire is that which I perceive at Montmorency ? It is that of St. Gratian, where Catinat lived the life of a sage, and under which his ashes were laid to rest. My soul, circumscribed within the precincts of a small village, takes its flight, and ranges over the capacious sphere of the age of Louis XIV. and hastens thence to expatiate through a sphere more sublime than that of the world, the sphere of virtue. Thanks to my ignorance, I can give the reins to the instinct of my soul. I plunge into infinity. I prolong the distance of places by that of ages ; and to complete the illusion, I make that enchanted spot the habitation of virtue.

OF THE SENTIMENT OF MELANCHOLY.

Beneficent Nature converts all her phenomena into so many sources of pleasure to man ; and if we attend to her procedure, it will be found that her most common appearances are the most agreeable. I enjoy pleasure, for example, when I see old mossy walls dripping, and hear the whistling of the wind, mingled with the clattering of rain. These melancholy sounds, in the night-time, throw me into a soft and profound sleep.

I cannot tell to what physical law philosophers may refer the sensations of melancholy ; I consider them as the most voluptuous affections of the soul. Melancholy is dainty ; it proceeds from its gratifying at once the body and the soul ; the sentiment of our misery and of our excellence.

In bad weather, the sentiment of my human misery is tranquillized by seeing it rain, while I am under cover ; by hearing the wind blow violently, while I am comfortably in bed. I, in this case, enjoy a negative felicity. With this are afterwards blended some of those attributes of the Divinity, the perceptions of which communicate such exquisite pleasure to the soul. It looks as if Nature were then conforming to my situation, like a sympathizing friend. She is besides at all times so interesting, under whatever aspect she exhibits herself, that when it rains I think I see a beautiful woman in tears. She seems to me more beautiful the more that she wears the appearance of affliction. In order to be impressed with these sentiments, which I venture to call voluptuous, I must have no project in hand of a pleasant walk, of visiting, of hunting, which perhaps would put me into bad humour to enjoy bad weather ; the soul must be travelling abroad, and the body at rest. From the harmony of those two powers of our constitution, the most terrible revolutions of Nature frequently interest us more than her gayest scenery.

The Pleasure of Ruin.

I for some time believed man had an unaccountable taste for destruction. If a monument is within reach of the populace, they are sure to destroy it. I have seen at Dresden, beautiful statues of females, mutilated by the Prussian soldiery, when in possession of that city. The common people

have a turn for slander, and take pleasure in levelling the reputation of all that is exalted. This malevolent instinct is not of Nature ; it is infused by the misery of individuals, whom education inspires with an ambition interdicted by society, and which throws them into a negative ambition. Incapable of rising, they are impelled to lay every thing low. This taste for ruin is not natural, but simply the exercise of the power of the miserable. Man in a savage state destroys the monuments only of his enemies ; he preserves those of his own nation ; he is naturally much better than man in a state of society, for he never slanders his compatriots.]

The passive taste for ruin is, however, universal. Our voluptuaries embellish their gardens with artificial ruins ; savages delight in melancholy repose by the brink of the sea, especially during a storm, or in the vicinity of a cascade surrounded by rocks. Magnificent destruction presents new picturesque effects ; and this curiosity, combined with cruelty, impelled Nero to set Rome on fire, to enjoy the spectacle of a vast conflagration. This kind of affection, by no means connected with our physical wants, has induced certain philosophers to allege, that our soul, being in a state of agitation, took pleasure in all extraordinary emotions ; but they have advanced their axiom as slightly as many others with which their works abound. First, the soul takes pleasure in rest as in commotion ; it is a harmony very gentle, and easily disturbed by violent emotions ; and granting it to be in its own nature a movement, I do not see that it ought to take pleasure in those which threaten it with destruction. Lucretius has come much nearer to the truth, when he says, tastes of this sort arise from the sentiment of our own security, heightened by the sight of danger to which we are not exposed. It is a pleasant thing, says he, to contemplate a storm from the shore. From this reference to self, it is, that the common people delight in relating, by the fire-side, during the winter evenings, frightful stories of ghosts, of men losing themselves by night in the woods, of highway robberies. From the same sentiment, also, the better sort take pleasure in the representations of tragedies, the descriptions of battles, of shipwrecks, and of the crash of empire. The security of the snug tradesman is increased by the danger to which the soldier, the mariner, the courtier, is exposed. [Pleasure of this kind arises from the sentiment of our misery.]

But there is a more sublime sentiment within us, which derives pleasure from ruin independently of all picturesque effect, and every idea of personal security; it is that of Deity, which ever blends itself with our melancholy affections, and constitutes their principal charm.

The heart of man is so naturally disposed to benevolence, that the spectacle of a ruin which brings to recollection only the misery of our fellow-men, inspires us with horror, whatever may be the picturesque effect it presents. It is not so with ruins effected by time. These give pleasure by launching us into infinity; they carry us several ages back, and interest us in proportion to their antiquity. Hence the reason why the ruins of Italy affect us more than those of our own country; the ruins of Greece more than those of Italy; and the ruins of Egypt more than those of Greece. The ruins in which Nature combats with human art inspire a gentle melancholy. In these she discovers to us the vanity of our labours, and the perpetuity of her own. A fine style of architecture always produces beautiful ruins, the plans of art, in this case, forming an alliance with the majesty of those of Nature. The interest of ruin, however, is greatly heightened when some moral sentiment is blended with it.

The Pleasure of Tombs.

No monuments are more interesting than the tombs of men, especially those of our own ancestors. Every nation, in a state of Nature, and even many of those which are civilized, have made the tombs of their forefathers the centre of their devotions, and an essential part of their religion, those whose fathers rendered themselves odious to their children by a gloomy and severe education excepted. The tombs of progenitors are all over China among the principal embellishments of the suburbs of their cities, and of the hills in the country. They form the most powerful bonds of patriotic affection among savage nations. When the Europeans have sometimes proposed to these a change of territory, this was their reply: 'Shall we say to the bones of our fathers, Arise, and accompany us to a foreign land?' They always considered this objection as insurmountable.

Tombs have furnished to the poetical talents of Young and Gesner imagery the most enchanting. Our voluptuaries, who sometimes recur to the sentiments of Nature, have fac-

titious monuments erected in their gardens. These are not, it must be confessed, the tombs of their parents. But whence could they have derived this sentiment of funereal melancholy, in the very midst of pleasure? Must it not have been from the persuasion that something still subsists after we are gone? Did a tomb suggest to their imagination the idea of a corpse merely, the sight of it would shock rather than please them. How afraid are most of them at the thought of death! To this physical idea then some moral sentiment must undoubtedly be united. The voluptuous melancholy resulting from it arises, like every other attractive sensation, from the harmony of two opposite principles; the sentiment of our immortality; which unite on beholding the last habitation of mankind. A tomb is a monument erected on the confines of the two worlds.

It first presents the end of the vain disquietudes of life, and the image of everlasting repose: it afterwards awakens in the confused sentiment of a blessed immortality, the probabilities of which strengthen in proportion as the person whose memory is recalled was a virtuous character. There our veneration fixes. This is so unquestionably true, that though the dust of Nero and of Socrates is the same, no one would grant a place in his grove to the remains of the Roman emperor, were they deposited even in a silver urn; whereas, every one would exhibit those of the philosopher in the most honourable place of his best apartment, were they contained in a vase of clay.

It is from this intellectual instinct in favour of virtue, that the tombs of great men inspire us with a veneration so affecting. From the same sentiment too, those which contain objects once lovely excite so much pleasing regret; the attractions of love arising out of the appearances of virtue. Hence we are moved at the sight of a little hillock which covers the ashes of an amiable infant, from the recollection of its innocence; and melted into tenderness on contemplating the tomb of a young female, by her virtues the delight and hope of her family. To render such monuments interesting, bronzes, marbles, and gildings are unnecessary. The more simple they are, the more energetic is the sentiment of melancholy. They produce a more powerful effect when poor than rich, antique than modern, with details of misfortune than titles of honour, with the attributes of virtue than those of

power. In the country principally their impression is most felt. A simple unornamented grave there, causes more tears to flow than the gaudy splendour of a cathedral interment. There grief assumes sublimity, ascends with the aged yews in the church-yard, extends with the surrounding hills and plains, and allies itself with all the effects of Nature.

Oppressive labour and humiliation are incapable of extinguishing the impression of this sentiment in the breasts of even the most miserable. 'For two years,' says Father du Tertre, in his *History of the Antilles*, 'our negro Dominick, after the death of his wife, never failed, when he returned from his employment, to take the little boy and girl he had by her to the grave of the deceased, over which he sobbed and wept for more than half an hour together, while the poor children frequently caught the infection of his sorrow.' What a funeral oration for a wife and a mother! This man, however, was nothing but a wretched slave.

There results from the view of ruins another sentiment, independent of all reflection, that of heroism. Great generals have employed their sublime effect to exalt the courage of their soldiers. Alexander persuaded his army, loaded with the spoils of Persia, to burn their baggage; and that instant they were ready to follow him all over the world. William, Duke of Normandy, on landing his troops in England, set fire to his own ships, and the conquest of the kingdom was effected.

↳ No ruins excite sentiments so sublime as those of Nature. They represent this vast prison of the earth subject itself to destruction, and detach us at once from passion and prejudice, as from a momentary theatrical exhibition. When Lisbon was destroyed by an earthquake, its inhabitants on escaping from their houses embraced each other; high and low, friends and enemies, Jews and Inquisitors, known and unknown, each shared his clothing and provisions with those who had none. I have seen something similar to this on board a ship on the point of perishing in a storm. The first effect of calamity, says a celebrated writer, is to strengthen the soul, the second to melt it down; because the first emotion in man, under the pressure of calamity, is to rise up toward the DEITY; the second, to fall back into physical wants. This last effect is that of reflection, but the moral and sublime

sentiment almost always takes possession of the heart at sight of a magnificent destruction.

Ruins of Nature.

When predictions of the approaching dissolution of the world spread over Europe some ages ago, many persons divested themselves of their property ; and the same thing would perhaps happen at this day should similar opinions be propagated with effect. But such sudden and total ruins are not to be apprehended in the infinitely sage plans of Nature ; under them nothing is destroyed but what is by them repaired.

The apparent ruins of the globe, as the rocks which roughen its surface, have their utility. These appear as ruins in our eyes, because they are neither square nor polished, like the stones of our monuments ; but their anfractuosities are necessary to the vegetables and animals destined to find in them nourishment and shelter. Only for beings vegetative and sensitive has Nature created the fossil kingdom ; and when man raises useless masses out of it to these objects on the surface of the earth, she applies her chisel, to employ them in the general harmony.

If we attend to the origin and end of our works, those of the most renowned nations will appear frivolous. It is unnecessary that potentates should rear enormous masses of stone to inspire me with respect from their antiquity. A little flinty pebble of the brook is more ancient than the pyramids of Egypt. If I feel disposed to blend some moral sentiment with the monuments of Nature, I can say to myself on seeing a rock, ‘Here, perhaps, the good Fenelon reposed while meditating the plan of his divine Telemachus.’ Thus I embrace at once the past and future at sight of an insensible rock, and which, in consecrating it to virtue, by a simple inscription, I render infinitely more venerable than by decorating it with the five orders of architecture

Of the Pleasure of Solitude.

Melancholy renders solitude attractive. Solitude flatters our animal instinct by inviting us to a retreat so much more tranquil as the agitations of our life have been more restless ; and it extends our divine instinct, by opening perspectives of natural and moral beauties with all the attraction of sentiment. From the effect of these contrasts, and this double

harmony, no solitude is more soothing than that adjoining to a great city, and no popular festivity more agreeable than when enjoyed in the bosom of a solitude.

OF THE SENTIMENT OF LOVE.

If love were only a physical sensation, I would leave two lovers to reason and act conformably to the physical laws of the body, were my object to disgust the grossest libertine. Its principal act is accompanied with the sentiment of shame in the men of all countries. No nation permits public prostitution; and though enlightened navigators may have advanced that the inhabitants of Otaheite conformed to this infamous practice, observers more attentive have since adduced proof that, as to the island in question, it was chargeable only to young women in the lowest rank of society, but that the other classes there preserved the modesty common to all mankind.

Independently of the particular causes of shame, which are unknown to me, I think I discern one in the two powers which constitute man. The sense of love being, if I may so express myself, the centre to which all the physical sensations converge, there results a powerful opposition to that other intellectual power from which are derived the sentiments of divinity and immortality. Their contrast is the more collusive, that the act of the first is in itself animal and blind, and the moral sentiment which usually accompanies love more expansive and sublime. The lover, accordingly, to render his mistress propitious, never fails to make this take the lead, and employs every effort to amalgamate it with the other sensation. Thus shame arises from the combat of these two powers. Children naturally have it not, because love is not yet unfolded in them; young persons have a great deal of it, because those two powers are acting in them with all their energy; and most old people have none at all, because they are past the sense of love, from a decay of nature, or have lost its moral sentiment, from the corruption of society; or, which is a common case, from the effect of both together, by the concurrence of these two causes.

As Nature has assigned to the province of this passion, designed to be the means of perpetuating human life, all the animal sensations, she has likewise united in it all the sentiments of the soul; so that love presents to two lovers

not only the sentiments of our wants and the instinct of our misery, as those of protection, assistance, confidence, support, repose, but all the sublime instincts besides which elevate man above humanity. In this sense Plato defined love to be an interposition of the gods in behalf of young people.

Whoever would wish to be acquainted with human nature has only to study that of love; he would perceive springing out of it all the sentiments I have spoken of, and many others I have neither time nor talents to unfold. We shall remark, that this natural affection discloses its principal character by giving it all the advantage of a complete extension. It is in the season when each plant re-perpetuates itself by its flowers and fruit, that it acquires all its perfection and the characters which invariably determine it. It is in the season of love that the birds of song redouble their melody, and that those which excel in beauty of colour array themselves in their finest plumage, the various shades of which they delight to display. It is then the lusty bull presents his forehead, and threatens with the horn; the nimble courser frisks along the plain; the ferocious animals fill the forests with their roaring; and the tigress, exhaling the odour of carnage, makes the solitudes of Africa resound with her hideous yells.

It is likewise in the season of loving that all the affections natural to the heart of man unfold themselves. Then innocence, candour, sincerity, modesty, generosity, heroism, holy faith, are expressed with grace ineffable in the attitude and features of two young lovers. Love assumes in their souls all the characters of religion and virtue. They quit the tumultuous assemblies of the city and the corruptive paths of ambition, to seek some sequestered spot, where they may be at liberty to mingle and exchange the tender vows of everlasting affection. Lost at times in a religious intoxication, they consider each other as beings of a superior order. In the widely extended universe they behold no other felicity but that of living and dying together, or rather they have lost all sight of death. Love transports them into ages of infinite duration, and death seems to them only the transition to eternal union.

But should cruel destiny separate them, neither prospects of fortune nor friendship can afford consolation under the loss. They had reached heaven, they languish on earth; they are hurried in despair into a cloister, to employ the remaining

dregs of life in redemanding of God the felicity of which they enjoyed but one transient glimpse. Nay, long after their separation, when age has frozen up the current of sense, after having been distracted by numberless anxieties foreign to the heart, the bosom still palpitates at sight of the tomb which contains the object once so tenderly beloved. They had parted with it in the world, they hope to see it again in heaven. Unfortunate Heloisa ! what sublime emotions were kindled in thy soul by the ashes of thy Abelard ! Such celestial emotions cannot possibly be the effect of a mere animal act. Love is not a slight convulsion, as Marcus Aurelius calls it. To the charms of virtue and the sentiment of her divine attributes love is indebted for all that enthusiastic energy. Vice itself, in order to please, must borrow its looks and language.

All the forms of organized beings express intellectual sentiments, not only to the eyes of man, who studies Nature, but to those of animals, instructed at once by their instinct. An animal expresses in its features some ruling passion, as cruelty, sensuality, cunning, stupidity. But man alone, unless debased by the vices of society, bears upon his countenance the impress of a celestial origin. Every trait of beauty may be referred to some virtue ; as to innocence, candour, generosity, modesty, and heroism. It is to their influence man is indebted for the respect and confidence of the brute creation, unless they have been forced out of Nature by unrelenting persecution on the part of man.

However charming the harmony of the colours and forms of the human figure, there is no visible reason why its physical effect should exert an influence over animals, unless the impress of some moral power were combined with it. Plumpness of form, or freshness of colouring, ought rather to excite the appetite of ferocious animals than their respect or love. Finally, if we distinguish their impassioned character, they also can distinguish ours, and form a very accurate judgment as to our being cruel or pacific. The game birds, which fly the sanguinary fowler, gather confidently around the harmless shepherd.

Beauty is said to be arbitrary ; but this opinion has been already refuted by an appeal to matter of fact. The mutilations of the negroes are the effects of superstition or of a faulty education. Ferocious animals themselves are struck

at sight of these deformities. All travellers agree that when lions or tigers are famished, which rarely happens, and thereby compelled to attack caravans in the night, they fall first upon the beasts of burden, and next upon the Indians or the black people. The European figure, with its simplicity, has a much more imposing effect than when disfigured by African or Asiatic characters.

When not degraded by the vices of society, the expression of the human face is sublime. A Neapolitan, J. B. Porta, tried to trace in it relations to the figures of beasts, and composed a book embellished with engravings representing the human head under the forced resemblance of various animals. His system favours certain modern opinions, and is allied to the hideous changes which the passions produce in the human form. There is not, however, a single beautiful touch in a figure but what may be allied to some moral sentiment relative to virtue and to Deity. Ugliness might be also referred to some vicious affection, as jealousy, avarice, gluttony, or rage. Our philosophers are wide of the mark when they attempt to make the passions the only moving principles of human life: could they be presented with the expression of all the passions collected in one single head, it would appear more horrid than that of Medusa; it would be a likeness of Nero.

Every passion has an animal character, as J. B. Porta excellently observed. But every virtue too has its animal character; and never is a physiognomy more interesting than when you distinguish in it a celestial affection conflicting with an animal passion. Nay, I do not know whether it be possible to express a virtue otherwise than by a triumph of this kind. Hence modesty appears so lovely on the face of a young female, because it is the conflict of the most powerful of animal passions with a sublime sentiment. The expression of sensibility likewise renders a face extremely interesting, because the soul then shows it is suffering, and this sight excites a virtue in ourselves, namely, the sentiment of compassion. If the sensibility of the figure in question is active, that is, if it contemplates the misery of another, it strikes us still more, as it then becomes the divine expression of generosity.

The most celebrated statues and pictures of antiquity owe much of their high reputation to the expression of the har-

mony of the two opposite sentiments of passion and virtue. For example, an affecting piece from the pencil of Aristides of Thebes represented Biblis languishing to death of the love she bore to her own brother. In it there must have been distinctly represented the sentiment of virtue repelling a criminal passion, and that of fraternal friendship recalling the heart to love under the very appearances of virtue. These cruel consonances ; despair at the thought of being betrayed by her own heart, the desire of dying to conceal her shame, that of life to enjoy the sight of the beloved object, health wasting away under the pressure of conflicts so painful, must have expressed, amidst the languors of death and life, contrasts the most interesting on the countenance of that ill-fated maid.

In another picture of the same Aristides was represented to admiration a mother, wounded in the breast during the siege of a city, giving suck to her infant. She seemed afraid, says Pliny, lest it should draw in her blood with her milk. Alexander prized it so highly, that he had it conveyed to Pella, the place of his birth. What emotions must have been excited, in contemplating a triumph so exalted as that of maternal affection absorbing all sense of personal suffering !

The most powerful effects of love arise out of contradictory feelings melting into each other, just as those of hatred are frequently produced from similar sentiments which happen to clash. Hence no feeling can be more agreeable than to find a friend in a man we considered as an enemy ; and no mortification so poignant as meeting an enemy in the man whom we depended upon as a friend. These harmonic effects often render a slight and transient kindness more estimable than a continued series of good offices, and a momentary offence more outrageous than the declared enmity of a whole lifetime ; because in the first case feelings diametrically opposite graciously unite ; and in the second, congenial feelings violently clash. Hence too a single blemish in a man of worth frequently appears more offensive than all the vices of a libertine who displays only a solitary virtue, because from the effect of contrast these two qualities become more prominent, and eclipse the others in the two opposite characters. It proceeds likewise from the weakness of the human mind, which attaching itself always to a single point of the object which it contemplates, fixes on the most prominent quality

in framing its decisions ; hence we are every day falling into innumerable errors for want of studying these elementary principles of Nature.

I could multiply without end proofs of the two powers by which we are governed. Enough has been said on the subject of a passion the instinct of which is so blind, to evince that we are attracted to it, and actuated by it, from laws widely different from those of digestion. Our affections demonstrate the immortality of the soul, because they expand in all the circumstances in which they feel the attributes of Deity, such as that of infinity, and never dwell with delight on the earth, except on the attractions of virtue and innocence.

OF SOME OTHER SENTIMENTS OF DEITY, AND AMONG OTHERS,
OF THAT OF VIRTUE.

There are besides these many sentimental laws, not in my power at present to unfold, as those which suggest presentiments, omens, dreams, the reference of events fortunate and unfortunate to the same epochs, and the like. Their effects are attested among all nations, by every man who attends to the laws of Nature. These communications of the soul with an order of things invisible are rejected by the learned of modern times ; but how many things exist, not reducible to the plans of our reason, or even perceived by it !

There are particular laws which demonstrate the immediate action of Providence on the human race, although opposite to the general laws of physics. For example, the principles of reason, passion, and sentiment, the organs of speech and hearing, are the same in men of all countries, yet the language of nations differs all the world over. How is speech so various among beings who have all the same wants, changing from father to son in such a degree, that we modern French no longer understand the language of the Gauls, and that the day is coming when our posterity will be unable to comprehend ours ? The ox of Bengal bellows like that of the Ukraine, and the nightingale pours out the same melodious strains to this day in our climates as those which charmed the ear of the Bard of Mantua by the banks of the Po.

It is impossible to maintain, though alleged by certain writers, that certain languages are characterized by climates ; were they subjected to influence of this kind, they would not

vary where the climate is invariable. The language of the Romans was at first barbarous, afterwards majestic, and is become at last soft and effeminate. They are not rough to the north, and soft to the south, as J. J. Rousseau pretends, who in treating this point has given far too great extension to physical laws. The language of the Russians is soft, being a dialect of the Greek; and the jargon of the southern provinces of France is harsh and coarse. The Laplanders speak a language grateful to the ear, and the Hottentots cluck like India cocks. The language of the Indians of Peru is loaded with strong aspirations and consonants of difficult pronunciation. Any one, without going out of his closet, may satisfy himself that the harshness or softness of a language has no relation whatever to latitude.

Other observers have asserted that the languages of nations have been determined and fixed by their great writers. Those of the age of Louis XIV. however, already begin to be antiquated among ourselves. If posterity fixes the character of a language to the age which has been productive of great writers, it is because the writings of those great men sparkle with maxims of virtue, and present a thousand perspectives of the Deity. The sublime sentiments which inspired them, illuminate them still in the order and disposition of their works, seeing they are the sources of all harmony. From this results the unalterable charm which renders the perusal of them so delicious at all times, and to men of all nations. The moral goodness of a period characterizes a language, and transmits it unaltered to the generation following; but these reasons do not explain the diversity of language which subsists between nations. It must ever appear to me altogether supernatural that men who enjoy the same elements, and are subjected to the same wants, should not employ the same words in expressing them. One sun illuminates the whole earth, and he bears a different name in every different land.

I beg leave to suggest a farther effect of a law but little attended to; that there never arises any one man eminently distinguished, in whatever line, but there appears at the same time, either in his own country or some neighbouring nation, an antagonist possessing talents and a reputation in complete opposition. This balancing of illustrious characters will not appear extraordinary, as it is a consequence of the general law of contraries which governs the world, and from which

all the harmonies of Nature result ; it must therefore particularly manifest itself in the human race, the centre of the whole, and actually discovers itself in the wonderful equilibrium of the two sexes, born in equal numbers. It does not fix on individuals in particular, for we see families consisting wholly of daughters, others all sons ; but whatever inequality of sex there may exist in the variety of births in families, the equality is constantly restored in the aggregate of the people.

There is another equilibrium no less wonderful. As many men perish in war, in sea-voyages, and by painful and dangerous employments, it would follow that the number of women would daily increase in proportion. Supposing there perishes annually one-tenth part more of men than women, the balancing of the sexes must become still more unequal. Social ruin must increase from the very regularity of natural order. This however does not take place ; the two sexes are always very nearly equally numerous : their occupations are different, but their destiny the same. The women, who frequently impel men to engage in hazardous enterprises to support their luxury, or who foment animosities and even kindle wars among them to gratify their vanity, are carried off in the security of pleasure and indulgence, by maladies to which men are not subject, but which frequently result from the moral, physical, and political pains which men undergo in consequence of them. Thus the equilibrium of birth between the sexes is re-established by the equilibrium of death.

Nature has multiplied those harmonic contrasts in all her works relatively to man ; for the fruits which minister to our necessities frequently possess in themselves opposite qualities, which serve as a mutual compensation.

These effects are not the mechanical results of climate, to the qualities of which they are frequently in opposition. All the works of Nature have the wants of man for their end, as all the sentiments of man have Deity for their principle. The final intentions of Nature have given to man the knowledge of all her works, as it is the instinct of Deity which has rendered man superior to the laws of Nature. This instinct, differently modified by the passions, engages the Russians to bathe in the ices of the Neva during the winter, and the nations of Bengal in the waters of the Ganges ; which,

under the same latitudes, has rendered women slaves in the Philippine Islands, and despots in the island of Formosa ; which makes men effeminate in the Moluccas, and intrepid in Macassar ; and which forms, in the inhabitants of one and the same city, tyrants, citizens, and slaves.

The sentiment of Deity is the first mover of the human heart. Examine a man in those unforeseen moments, when the secret plans of attack and defence with which social man continually encloses himself are suppressed, not on the sight of a vast ruin, which totally subverts them, but simply on seeing an extraordinary plant or animal : ‘ Ah, my God ! ’ exclaims he, ‘ how wonderful this is ! ’ and he invites the first person who happens to pass by to partake of his astonishment. His first emotion is a transport of delight which raises him to God ; the second a benevolent disposition to communicate his discovery to men ; but the social reason quickly recalls him to personal interest. When spectators are assembled round the object of his curiosity, ‘ It was I, ’ says he, ‘ who observed it first ; ’ and, if he be a scholar, he fails not to apply his system to it. By and by he begins to calculate how much this discovery will bring him in, and employs the whole credit of his junto to puff it off, and to persecute whoever presumes to differ from him in opinion. Thus every natural sentiment elevates us to God, till the weight of our passions and of human institutions brings us back again to self. J. J. Rousseau was accordingly right when he said that man was good, but men were wicked.

✕ The instinct of Deity first assembled men together, and became the basis of their religion and laws. On this Virtue found support, in proposing the imitation of the Divinity, not only by the exercise of the arts and sciences, but in the result of the divine power and intelligence, beneficence. It gave to man the sentiment of his own excellence, inspired him with the contempt of terrestrial and transient enjoyments, and a desire after things celestial and immortal. This sublime attraction exalted courage to the rank of a virtue, and made man advance intrepidly to meet death amidst so many anxieties to preserve life.

The instinct of Deity constitutes the charm of the performances we peruse with most delight. Writers to whom we always return with pleasure are not those who abound most in the social reason which endures but for a moment, but

those who render the action of Providence continually present to us. Hence Homer, Virgil, Xenophon, Plutarch, Fenelon, and most of the ancient writers, are immortal, and please all nations. Books of travels, though written artlessly, and derided by multitudes, who discern in them an indirect censure of their own conduct, are, nevertheless, the most interesting part of modern reading; not only by disclosing new benefits of Nature, as the fruits and animals of foreign countries, but because of the dangers their authors have escaped, frequently beyond all reasonable expectation. Finally, it is because we love still more to hear the fictions of Deity blended with the history of men, than to reason of men in the history of Deity.

This sublime sentiment inspires man with a taste for the marvellous; it balances in him the sentiment of his misery, which attaches him to the pleasures of habit, and exalts his soul by the desire of novelty. It is the harmony of human life, and the source of every thing delicious and enchanting in the progress of it. With this the illusions of love ever veil themselves, always representing the beloved object as something divine; and to ambition it opens perspectives without end. A peasant appears desirous only of becoming the churchwarden of his village. Be not deceived in the man! open a career to him without impediment—he is groom, becomes highwayman, captain of the gang, a commander-in-chief of armies, a king, and never rests till he is worshipped as a god.

With the sentiment of Deity, every thing is great, noble, beautiful, invincible, in the most contracted sphere of human life; without it, all is feeble, displeasing, and bitter, in the very lap of greatness. This conferred empire on Rome and Sparta, by showing to their poor and virtuous inhabitants the gods as their protectors and fellow-citizens; by the destruction of it they were given, when rich and vicious, to slavery. To no purpose does a man surround himself by the gifts of fortune; when this sentiment is excluded from his heart, languor takes possession of it. If its absence is prolonged, he sinks into sadness, into profound and settled melancholy, and finally into despair. If this state of anxiety becomes permanent, he lays violent hands on himself. (Man is the only sensible being which destroys itself in a state of liberty. Human life, with all its pomp and delights, loses even the

semblance of life when it ceases to appear immortal and divine.]

Whatever be the disorders of society, this celestial instinct is ever amusing itself with the children of men. It inspires the man of genius, by disclosing itself to him under eternal attributes. It presents to the geometrician the ineffable progressions of infinity; to the musician rapturous harmonies; to the historian, the immortal shades of virtuous men. It sheds a lustre on the unfortunate days of the labouring poor. Amidst the luxury of Paris, it extracts a sigh from the humble native of Savoy for the sacred covering of the snows upon his mountains. It expatiates along the ocean, and recalls from the gentle climates of India the European mariner to the stormy shores of the west. It bestows a country on the wretched, and fills with regret those who have lost nothing. It covers our cradles with the charms of innocence, and the tombs of our forefathers with the hopes of immortality. It reposes in the midst of tumultuous cities, on the palaces of mighty kings, and on the august temples of religion. It frequently fixes its residence in the desert, and attracts the attention of the universe to a rock. Thus are you clothed with majesty, venerable ruins of Greece and Rome! and you too, mysterious pyramids of Egypt! This is the object we are invariably pursuing; but the moment it discovers itself in some unexpected act of virtue, or in one of those indescribably sublime emotions, called sentimental touches by way of excellence, it first kindles in the breast an ardent movement of joy, and then melts us into tears. The soul, struck with this divine light, enjoys a glimpse of the heavenly country, and sinks at the thought of being exiled from it.

With wandering eyes explor'd the heavenly light,
Then sigh'd, and sunk into the shades of night.

STUDY THIRTEENTH.

APPLICATION OF THE LAWS OF NATURE TO THE DISORDERS
OF SOCIETY.

I HAVE exposed in this work the errors of human opinion, and the mischief resulting from them, as affecting morals and social felicity. But this would, in my own opinion, prove vain and unprofitable, unless I employed it in attempting to discover some remedies for the disorders of society.

Men who can turn the distresses of their country to their own private emolument, will reproach me with being its enemy, in the hackneyed observation, that things have always been so, and that all goes on very well, because all goes on well for them. Persons who discover and unveil the evils under which she labours are not her enemies; those who flatter her are most to be feared.

God forbid that I should attempt to disturb, much less destroy, the orders of the state. I would only wish to bring them back to the spirit of their natural institution. Would to God that the clergy would endeavour to merit by their virtues the distinction attached to the sacredness of their functions; that the nobility would protect the citizens, and be formidable only to the enemies of the people; that financiers, directing public treasure into the channels of agriculture and commerce, would open to merit the road which leads to useful and honourable employment; that woman, exempted by her feebleness from most of the burdens of society, would fulfil the duties of her gentle destination, those of wife and mother, thus cementing the felicity of one family; that, invested with grace and beauty, she would consider herself as a flower in that wreath of delight by which Nature has attached man to life; and while she proved a joy and a crown to her husband in particular, the complete chain of her sex might indissolubly compact all the other bonds of national felicity!

The joy of the people involuntarily inspires me with joy, and their misery wrings my heart. I do not reckon my obligation to them acquitted when I have paid a pecuniary consideration for their services. It is a maxim of the hard-

hearted rich man, 'That artisan and I are quit ; I have paid him.' The money which I give to a poor fellow for a service he has rendered me, creates nothing new for his use ; that money would equally circulate, and perhaps more advantageously for him, had I never existed. If I deprive a poor workman of part of his subsistence, I force him, in order to make up the deficiency, to become a beggar or a thief ; if I seduce a plebeian young woman, I rob that order of a virtuous matron ; if I manifest in their eyes a disregard to religion, I enfeeble the hope which sustains them under the pressure of their labours. Besides, religion lays me under an express injunction to love them. I am bound, therefore, to contribute my warmest wishes at least toward their felicity. I am able to demonstrate that their moral goodness is the firmest support of government, and that, notwithstanding their own necessities, to them our soldiery are indebted for the supplement to their miserable pittance of pay, and that to them the innumerable poor with whom the kingdom swarms owe a subsistence wrung from penury itself.

SALUS POPULI SUPREMA LEX ESTO, said the ancients: let the safety of the people be the paramount law, because their misery is the general misery. This axiom ought to be so much the more sacred in the eyes of legislators and reformers, that no law can be of long duration, and no plan of reform reduced into effect, unless the happiness of the people is previously secured. Out of their miseries abuses spring, are kept up, and renewed. It is from want of having reared the fabric on this sure foundation, that so many illustrious reformers have seen their political edifice crumble into ruins. If so many efforts towards reform, on the subject of the clergy and army, of finance, courts of justice, commerce, and concubinage, have failed, it is because the misery of the people reproduces the same abuses.

I have never seen a more flourishing country than Holland. The capital contains at least 180,000 inhabitants. An immense commerce presents a thousand objects of temptation, yet no robbery is committed ; they do not even employ soldiers for mounting guard. I was there in 1762, and for eleven years previous to that period no person had been punished capitally. The laws however are very severe, but the people, who possess the means of easily earning a livelihood are under no temptation to infringe them. Though the

have gained millions by printing all our extravagances in morals, politics, and religion, neither their opinions nor conduct have been affected by it, because the people are contented with their condition. Crimes spring up only from the extremes of indigence and opulence.

When at Moscow, I was informed, that since they had opened to the people various channels of subsistence, seditions, assassinations, robberies, and wilful fires had become less frequent than they used to be. The police at Paris prevents very alarming irregularities; but the tranquillity of the common people is to be accounted for from their finding there readier means of subsistence than in other cities of the kingdom.

The first step towards relieving the indigence of the commonalty is to diminish the excessive opulence of the rich. It is not by them that the people live, as modern politicians pretend. To no purpose do they institute calculations of the riches of a state, the mass is undoubtedly limited; and if it is confined to a small number of citizens, it is no longer in the service of the multitude. Wealthy men infer it to be more advantageous for the kingdom that a revenue of a hundred thousand crowns should be in the possession of a single person than portioned out among a hundred families, because, say they, the proprietors of large capitals engage in great enterprises. Here they fall into a pernicious error. The financier who possesses them only maintains a few footmen more, and extends the rest of his superfluity to objects of luxury and corruption: moreover, every one being at liberty to enjoy in his own way, should he be a miser this money is altogether lost to society, while a hundred families of respectable citizens could live comfortably on the same revenue, rear a numerous progeny, and furnish the means of living to many other families of the commonalty, by arts that are really useful, and favourable to good morals.

Unbounded opulence should therefore be checked, and an end put to the venality of employments, which confers them all on that portion of society which needs them least: a plurality of offices held by one person should also be done away. This abolition would destroy that moneyed aristocracy, which, by interposing an insurmountable barrier between the prince and his subjects, becomes in process of time the most dangerous of all governments. The dignity of employments

would thus be greatly enhanced, and rise in estimation when considered solely as the reward of merit; that respect for gold, which has corrupted every moral principle, would be diminished; that which is due to virtue would be heightened, and the career of public honour laid open to all the orders of the state.

Our princes have been taught to believe that it was safer to trust to the purses than to the probity of their subjects. Hence the origin of venality in the civil state: but this sophism disappears when we reflect that it subsists not in either the ecclesiastical or military order; these great bodies being, as to the individuals which compose them, the best ordered of any in the state.

The court employs frequent change of fashions, to enable the poor to live on the superfluity of the rich. This palliative is so far good, though subject to dangerous abuse: it ought to be fully converted to the profit of the poor, by prohibiting every article of foreign luxury in France; every piece of calico we import from Bengal prevents an inhabitant of our own islands from furnishing the raw material, and a family in France from spinning and weaving it into cloth. Another political and moral obligation ought to be enforced, that of giving back to the female sex the occupations which properly belong to them, as midwifery, millinery, linen-drapery, trimming, and the like, which require only taste and address, in order to rescue great numbers of them from idleness and prostitution, in which so many seek the means of supporting a miserable existence.

A vast channel of subsistence to the people might be opened by suppressing the exclusive privileges of commercial and manufacturing companies. These companies, we are told, provide a livelihood for a whole country. Their establishments, I admit, on the first glance, present an imposing appearance, especially in rural situations. They display great avenues of trees, vast edifices, courts within courts, palaces; but while the undertakers are riding in their coaches, the rest of the village are walking in wooden shoes. I never beheld a peasantry more wretched than in villages where privileged manufactures are established. Such exclusive privileges contribute more than is generally imagined to check the industry of a country. The villages of the Pais de Caux are in a very flourishing state, and the peasantry are rich, because there

are no exclusive privileges in that part of the country. The privileged undertaker having no competitor in a country, settles the workman's wages at his own pleasure. They have a thousand devices besides to reduce the price of labour as low as they can go. They give them, for example, a trifle of money in advance, and having thereby inveigled them into a state of insolvency, have them thenceforward at their mercy. I know a considerable branch of the salt-water fishery almost totally destroyed, in one of our seaports, by means of this underhand species of monopoly. The tradesmen of that town at first bought the fish of the fishermen to cure it for sale. They then built vessels proper for the trade, and advanced money to the fishermen's wives, during the absence of their husbands. These were obliged, on their return, to become hired servants to the merchant, to discharge the debt. He having thus become master of the boats, fishermen, and commodity, regulated the trade as he pleased. Most of the fishermen, disheartened by the smallness of their profits, quitted the employment ; and the fishery, formerly a mine of wealth to the place, is now dwindled to almost nothing.

On the other hand, if I object to a monopoly which would engross the means of subsistence bestowed by Nature on every order of society, and on both sexes, much less would I consent to a monopoly that should grasp at those which she has assigned to every man in particular. For example, the author of a book, a machine, or any invention, whether useful or agreeable, ought to be at least as well secured in a perpetual right over those who sell his book, or avail themselves of his invention, as a feudal lord is to exact the right of fines of alienation, from persons who build on his grounds, and even from those who resell the property of such houses. If the public suddenly lays hold of a useful invention, the state becomes bound to indemnify the author of it, to prevent the glory of his discovery from proving a pecuniary detriment to him. Did a law so equitable exist, we should not see a score of booksellers wallowing in affluence at the expense of an author who did not know, sometimes, where to find a dinner.

Immense landed property is still more injurious than money or employments, because it deprives other citizens, at once, of social and natural patriotism. It comes also in process of time into the possession of those who have employments and money ; it reduces all the subjects of the state to dependence

upon them, and leaves no resource for subsistence but the cruel alternative of degrading themselves by a base flattery of the passions of the great, or of going into exile. These three causes combined, the last especially, precipitated the ruin of the Roman empire, from the reign of the emperor Trajan.

Modern politics have advanced another very gross error, in alleging that riches always find their level in a state. When the indigent are once multiplied in it to a certain point, a wretched emulation is produced, who shall give himself away the cheapest. Whilst the rich man, teased by his famished compatriots for employment, overrates the value of his money, the poor, to obtain a preference, let down the price of their labour, till at length it becomes inadequate to their subsistence. Hence, in the best countries, agriculture, manufactures, and commerce, expire. Consult Brydone's *Tour to Italy*, respecting the luxury and extreme opulence of the Sicilian nobility and clergy, and the abject misery of the peasantry; and you will perceive whether money has found its level in that island or not.

IN Nature it is that we are to look for the subsistence of a people, and in their liberty the channel in which it is to flow. The spirit of monopoly has destroyed many of the branches of it among us, which are pouring in tides of wealth upon our neighbours; the Dutch, for instance, to whom the herring fishery has been a mine of wealth, and who hold out proportional encouragement to the citizens engaged in it. They erected a statue to the man who first discovered the method of smoking them, and of making what they call red-herring. They thought, and justly, that the citizen who procures for his country a new source of subsistence, a new branch of commerce, deserves to rank with those who enlighten or defend it. From such attentions as these, we see with what vigilance they watch over everything capable of contributing to public abundance. The felicity of the inhabitants presents a spectacle still more interesting. I never saw all over the country so much as one beggar, nor a house in which there was a single brick or a single pane of glass deficient. But the 'Change of Amsterdam is the great object of admiration. Most of the good people who there assemble are dressed in brown, and without ruffles. This contrast appeared so much the more striking, that only five days before I happened to be upon the Palais Royal at Paris, at the same hour of the day,

then crowded with people dressed in brilliant colours, with gold and silver laces, and prating about nothings, the opera, literature, kept mistresses, and such contemptible trifles, and who had not, the greatest part of them at least, a single crown in their pocket which they could call their own.

We must not suffer ourselves to be dazzled by the illusions of a prodigious commerce ; here our politics have frequently misled us. Trade and manufactures, we are told, introduce millions into a state ; but the fine wools, dye-stuffs, gold and silver, and other preparatives, imported from foreign countries, are tributes which must be paid back. The people would not have manufactured the less of the wools of the country on their own account ; and if its cloths had been of the lowest quality, they would at least have been converted to their use. What does it avail a people to clothe all Europe with their woollens, if they themselves go naked ; to collect the best wines in the world, if they drink nothing but water ; and to export the finest of flour, if they eat only bread made of bran ? Examples of such abuses might easily be adduced from Poland, from Spain, and from other countries, which pass for the most regularly governed.

✕ In agriculture chiefly France ought to look for the principal means of subsistence for her inhabitants ; it is the great support of morals and religion ; it renders marriages easy, necessary, and happy ; it contributes towards raising a numerous progeny, which it employs, almost as soon as they can crawl, in collecting the fruits of the earth, or tending the flocks and herds ; but it bestows these advantages only on small landed properties. Great landed properties expose the state to another inconvenience, hitherto almost unknown. The lands thus cultivated lie in fallow one year at least in three, and in many cases once every other year. It must happen, as in every thing left to chance, that sometimes great quantities of such lands lie fallow at once, and at other times very little. In those years, undoubtedly, when the greatest part of those lands is lying fallow, much less corn must be reaped than in other years. This source of distress is one of the causes of that dearth, or unforeseen scarcity of grain, which from time to time falls heavily, not on France only, but on the different nations of Europe.

✕ Nature has parcelled out the administration of agriculture between man and herself. To herself she has reserved the

management of the winds, the rain, the sun, the expansion of plants ; and she is wonderfully exact in adapting the elements conformably to the seasons : but she has left to man the adaptation of vegetables, of soils, the proportions which their culture ought to have to the societies to be maintained by them, and all the other cares and occupations which their preservation, distribution, and police demand. I consider this remark as of sufficient importance to evince the necessity of appointing a particular minister of agriculture. If he could not prevent chance combinations in the lands which might be in fallow all at once, he would be able to prohibit the transportation of the grain in those years when the greatest part of the land was in full crop, for it is clear that the following year the general produce will be so much less, as a considerable proportion of the lands will then of course be in fallow. \times Small farms are not subjected to such vicissitudes ; they are every year productive, and almost at all seasons, while an endless variety of delight results from the labours of the happy families who cultivate them. p. 2

O ye rich ! who wish to encompass yourselves with elysian scenery, let your park walls enclose villages blest with rural felicity. What deserted tracts of land over the whole kingdom might present the same spectacle ! Our agricultural companies, which there to no purpose employ their large ploughs of new construction, have pronounced the heaths of Britanny to be smitten with perpetual sterility ; but these heaths discover, by the ancient divisions of the fields, and the ruins of old huts and fences, that they were formerly cultivated. They are at this day surrounded by farms in a thriving condition. I repeat an assertion already hazarded : It is not on the face of vast domains, but into the basket of the vintager, and the apron of the reaper, that God pours down from heaven the precious fruits of the earth.

It would be necessary, to increase the national subsistence, to restore to the plough great quantities of land now in pasture. There is hardly a meadow in all China, a country so extremely populous. The Chinese sow everywhere corn and rice, and feed their cattle with the straw. They say it is better that the beasts should live with man than man with beasts. The German horses, the most vigorous of animals, feed entirely on straw cut short, with a small mixture of barley or oats. Our farmers are every day adopting practices direct

contrary to this economy. They turn, in many provinces, a great deal of land which formerly produced corn into small grass-farms, to save the expense of cultivation, and especially to escape the tithes, which their clergy do not receive from pasture lands. The following anecdote was told me, on my taking notice of an ancient tract of corn land which had undergone a metamorphosis of this sort. The rector, vexed at losing part of his revenue, without having it in his power to complain, said to the owner of the land, by way of advice: ‘Master Peter, in my opinion, if you would remove the stones from that ground, dung it well, plough it thoroughly, and sow it with corn, you might still raise very excellent crops.’ The farmer, an arch, shrewd fellow, perceiving the drift of his tithing-man, replied: ‘You are in the right, good Mr. Rector, if you will take the ground, and do all this to it, I shall ask no more of you than the tithe of the crop.’

Our agriculture will never attain its wonted activity, unless restored to its native dignity. ✕ Easy and idle burghers, who vegetate in our small cities, ought therefore to go and live in the country. To determine them to this, husbandmen ought to be exempted from tallage, seignorial exactions, and even the military service, to which they are at present subjected. The state must undoubtedly be served when necessity requires; but wherefore affix characters of humiliation to the services she imposes? Why not accept a commutation in money? Besides, the more inhabitants that are scattered over a country, the lighter will fall the burden on those who are assessable. A man would rather suffer in his purse than in his self-love.

By what fatal contradiction have we subjected the lands of France to soccage tenures, and ennobled those of the New World? The same husbandman who in France must pay tallage, and labour on the high road, may introduce his children into the king’s household, if an inhabitant of the West India islands. This injudicious dispensation of nobility has proved no less fatal to those foreign possessions than to the mother country. Nature invited to the wildernesses of America the overflowings of European nations: she has there disposed everything with an intention truly maternal, to indemnify Europeans for the loss of their country. ✕ In those regions a man need not scorch himself in the sun while he reaps his grain, nor be benumbed with cold while tending

his flocks, nor cleave the stubborn earth with the clumsy plough to make it produce aliment for him, nor rake into its bowels to extract iron, stone, clay, and the first materials of his house and furniture. Kind Nature has there placed on trees, in the shade, and within the reach of the hand, all that is necessary and agreeable to human life; she has scattered about, for the purposes at once of delight and of commerce, along the rivers, in the bosom of rocks, and in the very bed of torrents, the maize, sugar-cane, chocolate-nut, and tobacco-plant, with many other useful vegetables; and from the resemblance of the latitudes of this New World to that of the different countries of the Old, she promised its future inhabitants to adopt, in their favour, the coffee-plant, the indigo, and the other most valuable productions of Africa and Asia. Wherefore has the ambition of Europe inundated those happy climates with the tears and blood of the human race? Ah, had liberty and virtue collected and united their first planters, how many charms would French industry have added to the natural fecundity of the soil, to the happy temperature of the tropical regions!

What delicious retreats might our poor soldiers and possessionless peasants find in those fortunate islands! What expense in garrisons might there have been spared! What petty seignories might there have become the recompense either of gallant officers, or of virtuous citizens! What nurseries of excellent seamen might be formed by the turtle fishery, or by the still more extensive and profitable cod fishery on the banks of Newfoundland! It would not have cost Europe much more than the expense of the settlement of the first families. With what facility might they have been extended to the most remote distances, by forming them, after the manner of the Caribs themselves, one after another, and at the expense of the community! Undoubtedly, had this natural progression been adopted, our power would at this day have extended to the very centre of the American continent, and bidden defiance to every attack.

Government has been taught to believe that the independence of our colonies would be a necessary consequence of their prosperity, and the case of the Anglo-American colonies has been adduced in proof. But these colonies were not lost to Great Britain because she had rendered them too happy; it was, on the contrary, because she oppressed them.

Britain was besides guilty of great error, by introducing too great a mixture of strangers among her colonists. There is a remarkable difference between the genius of the English and ours. The Englishman carries his country with him wherever he goes: if he is making his fortune abroad, he embellishes his habitation in the place where he has settled, introduces the manufactures of his own nation into it, there he lives and dies; or if he returns to his country, fixes his residence near the place of his birth. All the Frenchmen whom I have seen in the islands consider themselves as strangers there. During a twenty years' residence in one habitation, they will not plant a single tree before the door of the house, for the benefit of enjoying its shade: to hear them talk, they are on the wing to depart next year at farthest. If they happen to acquire a fortune, away they go, and on their return home settle, not in their native province or village, but at Paris. This natural aversion to the place of birth, and predilection in favour of the capital, is an effect of several moral causes, and among others of education; and this turn of mind will alone for ever prevent the independence of our colonies. The expense of preserving them, and the facility with which they are captured, ought to have cured us of this prejudice.

We have had insurrections in our colonies, owing to the injudicious choice of the persons sent thither, who have at all times rendered them the seat of discord. How could it be expected that citizens who had disturbed the tranquillity of a long-established state of society, should concur in promoting the peace and prosperity of a rising community? The Greeks and Romans employed the flower of their youth, and most virtuous citizens, in the plantation of their colonies, and they became kingdoms and empires. What harm would have ensued had shoots from the tree of France borne lilies in America, and shaded the New World with their majestic branches? Let the truth be frankly acknowledged, Few men admitted to the councils of princes take a lively interest in the felicity of mankind. When sight of this great object is lost, national prosperity and the glory of the sovereign quickly disappear. Our politicians, by introducing into the colonies the slavery of the negroes, have formed a connexion between them and Africa, and broken asunder that which ought to have united them to their poor fellow-citizen.

By giving them perpetually new civil and military rulers, who keep them under a severe yoke—men, in a word, eager to accumulate fortune—they have betrayed ignorance of the French character, and have accordingly succeeded neither in forming colonists for America nor patriots for France: they have mistaken at once the interests of their nation and of the sovereigns whom they meant to serve.

These abuses are not yet beyond the power of remedy; there are still lands in the New World on which a change may be attempted in the nature of our establishments. There are only two methods of cure; the first, to extinguish division, the second, to multiply and increase the motives to union.

In general, the real spirit of patriotism, the first sentiment of humanity, is very rare in Europe. When we read relations of the customs and manners of the nations of Asia, we are touched with humanity, which among them attracts men to each other. If, for example, an Asiatic on a journey stops to enjoy his repast, his servants place themselves at his table. Should a stranger pass by, he too sits down, and after having made an inclination of the head to the master of the family, and given God thanks, rises and goes on his way, without being interrogated who he is, whence he comes, or whither he goes. This hospitable practice is common to the different nations of Asia, Africa, and America. In those countries man is still dear to man.

At Paris, on the contrary, if you go into the dining-room of a tavern, where a dozen tables are spread, should twelve persons arrive one after another, each takes his place apart at a separate table, without uttering a syllable. For some time a profound silence prevails, till some thoughtless fellow, put into good humour by his dinner, and pressed by an inclination to talk, takes upon him to begin the conversation. If he has the air of a person of consequence, that is rich, they give him the hearing; but if his appearance displays no mark of extraordinary distinction, had he delivered sentiments worthy of a Socrates, he is immediately contradicted; the conversation then becomes general and noisy; sarcasms, perfidious insinuations, gross abuse, conclude the sitting, and each of the guests retires well pleased with himself, but with a hearty contempt for the rest. The same scenes are acted in our coffee-houses and public walks. Men go thither to

unt for admiration, or to criticise. It is not the spirit of society which allures us toward each other, but the spirit of division.

Our public spectacles farther increase the spirit of division among us. Our most celebrated comedies usually represent tutors cozened by their pupils, fathers by their children, husbands by their wives, masters by their servants. These instruct them to undervalue morals and magistrates. Spectacles draw together bodies of the citizens, and alienate their minds.

Comedy teaches us to laugh at another, and nothing more. No one says, when the representation is over, the portrait of this miser resembles myself, but instantly discerns in it the image and likeness of his neighbour. But on the supposition that a man should perceive himself in the dramatic representation, I do not perceive how the reformation of vice would ensue. If my vice is held up as an object of ridicule, the laugh, so far from disgusting, plunges me in the deeper. I employ every effort to conceal it; I become a hypocrite; without taking into the account, that the laugh is much more frequently levelled against virtue than against vice.

I do not deny that spectacles, such as tragedies, may have a tendency to unite the citizens. The Greeks employed them to this effect; but by adopting their dramas we deviate from their intention. Their theatrical representations did not exhibit the calamities of other nations, but those which they themselves had endured, and events borrowed from the history of their own country. Our tragedies excite a compassion whose object is foreign to us.

Such means as these, though more powerful than drafts for the militia, and than either pressing or tricking men into the service, are still insufficient to form real citizens. We are accustomed by them to love virtue and our country only when our heroes are applauded on the theatre. They delight, are applauded, powdered, and perfumed; but were we to meet with one pouring out his blood in some obscure corner, and perishing in unmerited ignominy, we would not acknowledge him to be a hero.

The soldiery ought to be united more intimately with the nation, and their condition rendered more happy. The King of Prussia has contrived to inspire his soldiers, not with the spirit of corps, which divides, but the spirit of country, which

unites them. This he has accomplished by conferring on them most of the civil employments in his kingdom, as a recompense of military services. The Russians employ only one, still more powerful, I mean religion. A Russian soldier believes that to serve his sovereign is to serve God. He marches into the field of battle, in the full persuasion that if he falls in it he will go directly to Paradise. If the soldiery are sometimes guilty of irregularities, to our military institutions the blame must be imputed. I have seen others under better discipline, but know of none more generous. A soldier's profession is a perpetual exercise of virtue, from the necessity to which it constantly subjects the man to submit to privations innumerable, and frequently to expose his life. It has religion therefore for its principal support.

It is our wretched political constitution which produces in the state so many different centres. There was a time when we talked of our being republicans. Verily, if we had not a king, we should live in perpetual discord. Nay, how many sovereigns do we make of one single and lawful monarch ! Every corps has its own, who is not the sovereign of the nation. Amidst these various conflicts of paramount authority, nothing is executed. The real king, the king of the people, is not served.

The same spirit of division prevails in the religion of Europe. What mischief has not been practised in the name of God ! All acknowledge the One Supreme Being, who created the heavens and the earth, and man ; but each kingdom has its own, who must be worshipped according to a certain ritual. In his name it was that the poor Americans were exterminated. The God of Europe is clothed with terror, and devoutly adored. But where are the altars of the God of Peace, of the Father of Mankind, of Him who proclaims the glad tidings of the Gospel ? Let our modern politicians trumpet their own applause on the happy fruits of those divisions, and of an education dictated by ambition. Human life, so fleeting and wretched, passes away in this unremitting strife ; and while the historians of every nation, well paid for their trouble, are extolling to heaven the victories of their kings and pontiffs, the people are addressing themselves in tears to the God of the Human Race, and asking of him the way in which they ought to walk, to reach his habitation at length, and live a life of virtue and happiness upon the earth.

OF PARIS.

The greatest part of Frenchmen who acquire fortune in foreign countries, on their return settle at Paris. This upon the whole is no great injury to the state. The slighter their attachment to their country, the easier it is to fix them at Paris. One single point of union is necessary to a great nation. I am fond of Paris. Next to a rural situation, such as I like, I prefer Paris to anything I have ever seen in the world. I love that city for its happy situation, because all the accommodations of human life are there collected, from its being the centre of all the powers of the kingdom, and because it is the asylum of the miserable. There provincial ambitions, prejudices, aversions, and tyrannies, are annihilated ; there a man may live in obscurity and liberty ; there it is possible to be poor without being despised. The afflicted person is there decoyed out of his misery by the public gayety ; and the feeble there feels himself strong in the strength of the multitude. Time was when I looked upon that city as too great ; I am now far from thinking it sufficiently majestic to be the capital of so flourishing a kingdom.

✕ I could wish, our seaports excepted, there were no city in France but Paris ; that our provinces were covered only with hamlets and villages, and subdivided into small farms ; and that, as there is but one centre in the kingdom, there might likewise be but one capital. Would to God it were that of all Europe, nay of the whole earth ; and that, as men of all nations bring thither their industry, passions, wants, and misfortunes, it should give them back, in fortune, enjoyment, virtues, and sublime consolations, the reward of that asylum which they resort thither to seek !

Of a truth, our mind, now illuminated with such various knowledge, wants the nobly comprehensive grasp which distinguished our forefathers. They entertained the idea, I believe, of rendering it the capital of Europe. The traces of this design are visible in most of their establishments, as the Scottish College, the Irish, that of the Four Nations, and in the foreign names of the royal household troops. Behold that noble monument of antiquity, the church of Notre Dame, built more than 600 years ago, when Paris did not contain the fourth part of its present inhabitants ; it is more vast and majestic than anything of the kind which has been since

reared. Men of every nation are welcome there for their money; our enemies themselves may live quietly in it, in the very midst of war, provided they are rich; but above all, I could wish to render her good and propitious to her own children. I do not know of any advantage a Frenchman derives from having been born within her walls, unless it be, when reduced to beggary, that of having it in his power to die in one of her hospitals. Rome bestowed very different privileges on her citizens; the most wretched among them enjoyed privileges and honours more ample than were communicated even to kings in alliance with the republic.

Pleasure attracts strangers to Paris; and if we trace those vain pleasures up to their source, we shall find they proceed from the misery of the people, and from the easy rate at which it is there possible to procure productions which minister to luxury. These means have been highly extolled by modern politicians. I do not deny that they occasion a considerable influx of money into a country; but at the long run, neighbouring nations imitate them; the money of strangers disappears, but their debauched morals remain.

The noblest spectacle which any government can exhibit, is that of a people laborious, industrious, and content. We are taught to be well read in books, pictures, algebra, and heraldry, but not in men. Connoisseurs are wrapt with admiration at sight of a Savoyard's head painted by Greuze, but the Savoyard himself is at the corner of the street, speaking, walking, almost frozen to death, and no one minds him. That mother with her children around her form a charming group; the picture is invaluable: the originals are in a neighbouring garret without a farthing whereupon to subsist. Behold that general officer mounted on his prancing courser, reviewing a body of troops: see, the heads, shoulders, and feet of his soldiers, arranged in the same straight line; the whole corps has but one look, one movement. He makes a sign, and in an instant a thousand bayonets gleam in the air; he makes another, and a thousand fires start from that rampart of iron. He gallops round those smoke-covered regiments, at the sound of drums and fifes, and you have the image of Jupiter's eagle armed with the thunder, and hovering round Etna. A hundred paces from thence behold an insect among men. Look at that puny chimney-sweeper, with his lantern, cymbal, and leathern

greaves; he resembles a black beetle. This child, those soldiers, and that general, are equally men; and while birth, pride, and the demands of social life, establish infinite differences among them, religion places them on a level; she humbles the head of the mighty, by showing them the vanity of their power; and raises up the head of the unfortunate, by disclosing to them the prospects of immortality: she thus brings back all men to the equality established by Nature at their birth, and which the order of society had disturbed.

Had I been blessed with but a moderate degree of fortune, I would have procured for myself in Paris an endless succession of new enjoyments. I would have hired lodgings in different parts of the city and suburbs, to be found, undoubtedly, at an easy rate, but it may not be so easy to find persons of probity for hosts and neighbours. There is much depravity among the lower orders, but various methods may be employed to find out such as are good and honest, and with them I commence my researches after pleasure. A new Diogenes, I am set out in search of men. As I look only for the miserable, I have no occasion to use a lantern. I get up at day-break, and partake of a first mass in a church still but half illumined by the day-light; there I find poor mechanics come to implore God's blessing on their day's labour. Piety, exalted above all respect to man, is one assured proof of probity; cheerful submission to labour is another. I perceive in raw and rainy weather a whole family squat on the ground, weeding the plants of a garden: here again are good people. The night itself cannot conceal virtue. Towards midnight, the glimmering of a lamp announces, through the aperture of a garret, some poor widow prolonging her nocturnal industry, to bring up by the fruits of it her little ones sleeping around her. These shall be my neighbours and my hosts. I announce myself to them as a wayfaring man, who wishes to breathe a little in that vicinity. I beseech them to accommodate me with part of their habitation, or to look out for an apartment that will suit me in their neighbourhood. I offer a good price, and am domesticated presently.

I am carefully on my guard, in the view of securing the attachment of those honest people, against giving them money for nothing, or by way of alms; I know of means much more honourable to gain their friendship. I order more

provision than is necessary for my own use, and the overplus turns to account in the family; I reward the children for any little services which they render me: I carry the whole household of a holyday into the country, and dine with them upon the grass; the father and mother return to town in the evening well refreshed, and loaded with a supply for the rest of the week. In winter I clothe the children with good woollen stuffs, and their little warmed limbs bless their benefactor, because my vain-glorious bounty has not frozen their heart. The less closely you twist the bands of gratitude, the more firmly do they contract of themselves.

I enjoy not only the pleasure of doing good, but of amusing and instructing myself. We admire in books the labours of the artisan, but books rob us of half our pleasure and of the gratitude which we owe them. Besides, there is more knowledge in the head of an artisan than in his art, and more intelligence in his hands than in the language of the writer who translates him. Objects carry their own expression upon them: *Rem verba sequuntur*, (words follow things.) The man of the commonalty has more than one way of observing and of feeling, which is not a matter of indifference. While the philosopher rises into the clouds, the other keeps contentedly at the bottom of the valley, and beholds very different perspectives in the world. Calamity forms him at length as well as another man. His language purifies with years; and I have frequently remarked very little difference, in point of accuracy, perspicuity, and simplicity, between the expressions of an aged peasant and an old courtier. Time effaces from their language and manners the rusticity and refinement society had introduced. Old age, like infancy, reduces all men to a level, and gives them back to Nature.

In one of my stations I have a landlord who has made the tour of the globe. He has been seaman, soldier, bucanier. He is as sagacious as Ulysses, but more sincere. When at table with me, he gives me a relation of his adventures. He knows a multitude of anecdotes. How many times was he on the very point of making his fortune, but failed! He is a second Ferdinand Mendez Pinto! He has now got a good wife, and lives contented.

Another of my landlords has lived a very different life; he scarcely ever was beyond the walls of Paris, and but seldom from his shop. But though he has not travelled, he

has had his share of calamity. He was at ease, and had laid up fifty good louis-d'or, when one night his wife and daughter eloped with his treasure. He almost died with vexation. Now, he says, he thinks no more about it; and cries as he tells me the story. I compose his mind by talking kindly to him; I give him employment; he tries to dissipate his chagrin by labour; his industry is an amusement to me: I sometimes pass complete hours in looking at him, as he bores and turns pieces of oak as hard as ivory.

Now and then I stop in the middle of the city before the shop of a smith, and am transformed into the Lacedemonian Liches, at Tegeum, attending to the processes of forging and hammering iron. The moment the man perceives me attentive to his work, I will soon acquire his confidence. I am not, as Liches was, looking for the tomb of Orestes, but I have occasion to employ a smith, if not for myself, for the benefit of some one else. I order this honest fellow to manufacture some solid articles of household furniture, which I intend to bestow as a monument to preserve my memory in some poor family. I wish besides to purchase the friendship of an artificer; I am sure the attention he sees I pay to his work will induce him to exert his utmost skill in executing it. I thus hit two marks with one stone. A rich man, in similar circumstances, would give alms, and confer no obligation on any one.

J. J. Rousseau told me a little anecdote of himself relative to the subject in hand. 'One day,' said he, 'I was at a village festival in a gentleman's country seat, not far from Paris. After dinner the company walked up and down the fair, and amused themselves with throwing pieces of small money among the peasantry, to have the pleasure of seeing them scramble and fight in picking them up. For my own part, following the bent of my solitary humour, I walked apart in another direction. I observed a little girl selling apples. To no purpose did she extol the excellence of her goods, no customer appeared to cheapen them. How much do you ask for all your apples? said I to her.—All my apples? replied she, and at the same time began to reckon with herself. Three-pence, Sir, said she.—I take them at that price, returned I, on condition you will go and distribute them among those little Savoyards whom you see there below: this was instantly executed. The children were quite transported with delight at this un-

expected regale, as was likewise the little merchant at bringing her wares to so good a market. I should have conferred much less pleasure on them had I given them the money. Every one was satisfied, and no one humbled.' The great art of doing good consists in doing it judiciously. Religion instructs us in this important secret, in recommending to us to do to others what we wish should be done to us.

I sometimes betake myself to the great road, like the ancient patriarchs, to do the honours of the city to strangers who arrive. I recollect when I myself was a stranger in strange lands, and the kind reception which I met with when far from home. I have frequently heard the nobility of Poland and Germany complain of our grandees. They allege that French travellers of distinction are treated in those countries with unbounded hospitality and attention; but that they, on visiting France in their turn, are almost entirely neglected. They are invited to one dinner on their arrival, and to another when preparing to depart; and this is the whole amount of our hospitality. For my own part, incapable of acquitting the obligations of this kind which I lie under to the great of foreign countries, I repay them to their commonalty.

I perceive a German travelling on foot; I accost him, invite him to stop, and repose a little at my habitation. Supper and a glass of good wine dispose him to communicate the occasion of his journey. He is an officer; he has served in Prussia and in Russia; he has been witness to the partition of Poland. I interrupt him to make my inquiries after certain illustrious officers. Most of them are dead, he tells me; the rest superannuated. Oh! how melancholy it is, I exclaim, to make acquaintance with estimable men abroad whom we are never to see more! Oh! how rapid a career is human life! Happy the man who has it in his power to employ it in doing good! My guest favours me with a short detail of his adventures. He is under misfortunes; he has come to France to implore the Queen's protection; he hopes a great deal from her goodness. I confirm his hopes. I am pouring the balm of consolation, he tells me, into his heart. Full of emotion, he presses my hand. My cordial reception of him is a happy presage of the rest; he could have met with nothing so friendly even in his own country. Oh! what

pungent sorrow may be soothed to rest by a single word, and by the feeblest mark of benevolence !

I remember that one day I found, at the entrance into the Elysian Fields, a young woman sitting with a child in her lap, on the brink of a ditch. She was handsome, if that epithet may be applied to a female overwhelmed in melancholy. I walked into the sequestered alley where she was : the moment she perceived me she looked the other way ; her timidity and modesty fixed my eyes on her. I remarked that she was decently dressed, and wore very white linen ; but her gown and neck handkerchief were so completely darned over, that you would have said the spiders had spun the threads. I approached her with the respect due to the miserable ; I bowed, and she returned my salute with an air of gentility, but with reserve. I then endeavoured to engage her in conversation, by talking of the wind and the weather : her replies consisted of monosyllables only. At length I ventured to ask if she had come abroad for the pleasure of enjoying a walk in the country : upon this she began to sob and weep without uttering a single word. I sat down by her, and insisted, with all possible circumspection, that she would disclose to me the cause of her distress. She said, ‘ Sir, my husband has just been involved in a bankruptcy at Paris, to the amount of five thousand livres (208*l.* 6*s.* 8*d.*) ; I have been convoying him as far as Neuilly : he is gone, on foot, a journey of sixty leagues hence, to try to recover a little money which is due to us. I have given him my rings and other little trinkets, to defray the expense of his journey ; and all I have left in the world, to support myself and my child, is a single shilling piece.’—‘ What parish do you belong to, madam ? ’ said I.—‘ St. Eustache,’ replied she.—‘ The rector,’ I subjoined, ‘ passes for a charitable, good man.’—‘ Yes, sir,’ said she, ‘ but you need not to be informed that there is no charity in parishes for us miserable Jews.’ At these words her tears flowed more copiously, and she arose to depart. I tendered her a small pittance towards her present relief, which I besought her to accept at least as a mark of my good-will. She received it, and returned more reverences and thanks, and loaded me with more benedictions, than if I had re-established her husband’s credit. How many delicious banquets might that man enjoy who would in this way lay out three or four hundred pounds a year !

My different establishments variegates my life most innocently and agreeably. In winter I reside in that which is completely exposed to the noon-day sun ; in summer, I remove to that which has a northern aspect, and hangs over the cooling stream. To-day I sup under an acacia, and am in America ; to-morrow I shall dine in the midst of a kitchen garden, under an arbour shaded with lilac, and I shall be in France.

But, I shall be asked, is there nothing to be feared in such a style of living ? May I meet the final period of my days while engaged in the practice of virtue ! I have heard many a history of persons who perished in hunting matches, in parties of pleasure, but never in performing acts of beneficence. Gold is a powerful commander of respect with the commonalty. I display wealth sufficient to secure their attention, but not enough to tempt any one to plunder me. I am very circumspect in the choice of my hosts ; and if I perceive that I have been mistaken in my selection, the rent of my lodging is paid beforehand, and I return no more.

On this plan of life I have not the least occasion for the encumbrances of furniture and servants. With what tender solicitude am I expected in each of my habitations ! What satisfaction does my arrival inspire ! What attention and zeal do my entertainers express to outrun my wishes ! I enjoy among them the choicest blessings of society, without feeling any of the inconveniences. No one sits down at my table to backbite his neighbour, and no one leaves it with a disposition to speak unkindly of me. I have no children, but those of my landlady are more eager to please me than their own parents. I have no wife : the most sublime charm of love is to devise and accomplish the felicity of another. I assist in the formation of happy marriages, or in promoting the happiness of those which are already formed. I thus dissipate my personal languor, I put my passions upon the right scent, by proposing to them the noblest attainments at which they can aim upon the earth. I have drawn nigh to the miserable with an intention to comfort them, and from them perhaps I shall derive consolation in my turn.

Thus might you live, O ye great ones of the earth ! and multiply your fleeting days in the land through which you are merely travellers. Thus you may learn to know men ; thus issuing from your palaces, encircled by happy vassals,

you might present the image of the ancient patricians, a name so dear to the Roman people. You are every day looking out for some new spectacle ; no one possesses so much the charm of novelty as the happiness of mankind. You wish for interesting objects ; there is no one more interesting than the sight of the families of the poor peasantry, diffusing fruitfulness over your vast and solitary domains, or superannuated soldiers, who have deserved well of their country, seeking refuge under the shadow of your wings. Your compatriots are surely much better than tragedy heroes, more interesting than the shepherds of the comic opera.

The indigence of the commonalty is the first cause of the physical and moral maladies of the rich. It is the business of administration to provide a remedy. As to the maladies of the soul resulting from indigence, I could wish some palliatives at least might be found. We have, I grant, confessors and preachers, for whom the sublime function of comforting the miserable seems to be reserved. But confessors are not always of the same disposition with their penitents, especially when the penitent is poor and not much known to them. The point is not to pronounce absolution to the man who confesses his sins, but to assist him in bearing up under those of another, which lie much heavier upon him.

As to preachers, their sermons are usually too vague, and too injudiciously applied to the various necessities of their hearers. They will declaim against avarice to a prodigal, or against profusion to a miser. They will expatiate on the dangers of ambition to a young man in love ; and on those of love to an ancient female devotee. They will inculcate the duty of giving alms on the persons who receive them, and the virtue of humility on a poor water-porter. We have no sermons calculated to cure languor, sorrow, scrupulousness of conscience, melancholy, chagrin, and so many other distempers which prey upon the soul. It is no easy matter to find out, in a soul wounded and oppressed with timidity, the precise point of its grief, and to apply the balm and the hand of the good Samaritan to the sore. This is an art known only to minds endowed with sensibility, who have themselves suffered severely, and not always the attainments of the virtuous only. Ah ! if men who have themselves been acquainted with grief, would unite in presenting to the sons and daughters of affliction their experience and sensibility,

more than one illustrious sufferer would draw from them those consolations, which all the preachers, and books, and philosophy in the world, are incapable to administer. All that the poor man needs in many cases, in order to sooth his wo, is a person into whose ear he can pour out his complaint.

The people might farther be inspired with a relish for morality, without the use of much expensive cookery. Nay, every appearance of disguise renders truth suspected by them. I have many a time seen plain mechanics shed tears at reading some of our good romances, or at the representation of a tragedy. They afterwards demanded if the story which had thus affected them was really true; and on being informed that it was imaginary, they valued it no longer, and were vexed to think that they had thrown away their tears. The rich must have fiction to render morality palatable, and morality is unable to render fiction palatable to the poor, because the poor man still expects his felicity from truth, and the rich hope for theirs only from illusion. The moral principle therefore must be purified and directed in man. Religion prescribes to us the practice of virtue, seeing it is the road to happiness both in this world and that which is to come.

Should I have been so happy as to suggest a single good idea to one more enlightened than myself; should I have contributed to prevent one poor wretch in despair from going to drown himself, or in a fit of rage from knocking out his enemy's brains, or in the lethargy of languor from going to squander his money and his health away among loose women, I shall not have scribbled in vain.

Paris presents many a retreat to the miserable, known by the name of hospitals. May heaven reward the charity of those who have founded them, and the still greater virtue of those persons of both sexes who superintend them! But an adept in the science of finance having undertaken to furnish the plan of a receptacle for the sick, found on calculation that the expense of each of them would not exceed eight-pence halfpenny a day; that they might be much better provided on these terms, and at an easier rate, than in the hospitals. For my own part, I am clearly of opinion that these same pence, distributed daily in the house of a poor sick man, would produce a still farther saving, by contributing

to the support of his wife and children. A sick person of the commonalty needs little more than good broths ; his family might partly subsist on the meat of which they were made.

But hospitals are subject to many other inconveniences. *Maladies* of a particular character, sufficiently known, are there generated, frequently more dangerous than those which the sick carry in with them. Besides these, evils of a much more serious nature, which affect morals, are there communicated. I could wish, therefore, that so far from crowding together the miserable, they might be provided for, under the inspection of their own relations, or intrusted to the care of poor families.

Public prisons are necessary, but it is surely desirable that the unhappy creatures there immured should be less miserable while under confinement. Justice, undoubtedly, in depriving them of liberty, proposes not only to punish, but to reform their moral character. Excess of misery and evil communications can change it only from bad to worse. Experience farther demonstrates, that there it is the wicked acquire the perfection of depravity. One who went in only feeble and culpable comes out an accomplished villain. On this subject I shall briefly observe, that the only way to reform men is to render them happier. How many who were living a life of criminality in Europe, have recovered their character in the West India islands, to which they were transported ! They are become honest men there, having found more liberty and happiness than they enjoyed in their native country.

Another class of mankind still more worthy of compassion, because innocent, are persons deprived of their reason. They are shut up, and seldom fail, of consequence, to become more insane than before. I do not believe there is through all Asia, China excepted, a single place of confinement for lunatics. The Turks treat them with singular respect ; whether it be that Mahomet himself was subject to mental derangement, or from a religious opinion, that as soon as a madman sets his foot into a house, the blessing of God enters it with him. They delay not a moment to set food before him, and caress him in the tenderest manner. There is not an instance known of their having injured any one. Our madmen, on the contrary, are mischievous, because they are miserable.

The number of insane persons under confinement with us

is enormously great. There is not a provincial town of any considerable magnitude but what contains an edifice destined to this use. Their treatment in these is surely an object of commiseration, and loudly calls for the attention of government, considering that if, after all, they are no longer citizens, they are still men, and innocent men too. I shall relate an instance of the treatment of these miserable beings still fresh in my memory.

Some years ago, happening to pass through l'Aigle, in Normandy, I strolled out about sunset to enjoy a little fresh air. I perceived on a rising ground a convent most delightfully situated. A monk, who stood porter, invited me in to see the house. He conducted me through an immense court, in which the first thing that struck my eye was a man of about forty years old, with half a hat on his head, who advanced directly upon me, saying, 'Be so good as stab me to the heart; be so good as stab me to the heart.' The monk said to me, 'Sir, don't be alarmed; he is a poor captain, who lost his reason on account of an unmilitary preference that passed upon him in his regiment.'

'This house, then, said I to him, 'serves as a receptacle for lunatics.' 'Yes,' replied he, 'I am superior of it.' He walked me from court to court, and conducted me into a small enclosure, in which were several little cells of mason-work, where we had heard persons talking with much earnestness. There we found a canon in his shirt, with his shoulders quite exposed, conversing with a man of a fine figure, seated by a small table in front of one of those little cells. The monk went up to the poor canon, and with his full strength applied a blow of his fist to the wretch's naked shoulder, ordering him to turn out. His comrade instantly and emphatically said to the monk: 'Man of blood, you are guilty of a very cruel action. Do not you see that this poor creature has lost his reason?' The monk, struck dumb for the moment, bit his lips, and threatened him with his eyes. But the other, without being disconcerted, said to him: 'I know I am your victim; you may do with me whatever you please.' Then, addressing himself to me, he showed me his two wrists, galled to the quick by the iron manacles with which he had been confined.

'You see, sir,' said he to me, 'in what manner I am treated!' I turned to the monk with an expression of indignation at a conduct so barbarous. He coolly replied:

‘ Oh ! I can put an end to all his fine reasoning in a moment.’ I addressed, however, a few words of consolation to the unfortunate man, who, looking at me with an air of confidence, said, ‘ I think, sir, I have seen you at St. Hubert, at the house of M. the Mareschal de Broglio.’ ‘ You must be mistaken, sir,’ replied I, ‘ I never had the honour of being at the Mareschal de Broglio’s.’ Upon that he instituted a process of recollection respecting the different places where he thought he had seen me, with circumstances so accurately detailed, and clothed with such appearances of probability, that the monk, nettled at his well-merited reproaches, and at the good sense which he displayed, thought proper to interrupt his conversation, by introducing a discourse about marriage, the purchase of horses, and so on. The moment the chord of his insanity was touched, his head was gone. On going out, the monk told me that this poor lunatic was a man of very considerable birth. Some time afterwards I had the pleasure of being informed that he had found means to escape from his prison, and had recovered the use of his reason.

Many physical remedies are employed for the cure of madness ; but it frequently proceeds from a moral cause, for it is produced by chagrin. Might there not be a possibility to employ, for the restoration of reason to those disordered beings, means directly opposed to those which occasioned the loss of reason ; I mean mirth, pleasure, and above all, the pleasures of music ? We see, from the instance of Saul, what influence music possesses for re-establishing the harmony of the soul. With this ought to be united treatment the most gentle, and care to place the unhappy patients, when visited with paroxysms of rage, not under the restraint of fetters, but in an apartment matted round, where they could do no mischief either to themselves or others. I am persuaded that by employing such humane precautions, numbers might be restored, especially if they were under the charge of persons not interested in perpetuating their derangement. It would likewise be proper, in my opinion, to commit the care of men disordered in their understanding to females, and that of females to men, on account of the mutual sympathy of the two sexes with each other.

After having rendered the capital a resort of happiness and improvement to our own nation, I would allure to it the men

of foreign nations from every corner of the globe. O ye women ! who regulate our destiny, how much ought you to contribute towards uniting mankind, in a city where your empire is unbounded ! In ministering to your pleasures do men employ themselves over the face of the whole earth. While you are engrossed wholly in enjoyment, the Laplander issues forth in the midst of storm and tempest to pierce with his harpoon the enormous whale, whose beard is to serve for stuffing to your robes : a man of China puts into the oven the porcelain out of which you sip your coffee, while an Arabian of Mocha is busied in gathering the berry for you : a young woman of Bengal, on the banks of the Ganges, is spinning your muslin, while a Russian, amidst the forests of Finland, is felling the tree which is to be converted into a mast for the vessel that is to bring it home to you.

The glory of a great capital is to assemble within its walls the men of all nations who contribute to its pleasures. I could wish that Paris were as large, and of a population as much diversified, as those ancient cities of Asia, such as Nineveh and Suza, whose extent was so vast that it required three days to make the tour of them, and in which Ahasuerus beheld two hundred nations bending before his throne. I could wish that every people on the face of the earth kept up a correspondence with that city, as the members with the heart in the human body. What secret did the Asiatics possess to raise cities so vast and populous ? They are in all respects our elder brothers. They permitted all nations to settle among them. Present men with liberty and happiness, and you will attract them from the ends of the earth.

The good Henry IV. had formed the celestial project of engaging all Europe to live in peace ; but his project was not sufficiently extensive to support itself : war must have fallen upon Europe from the other quarters of the world. Our particular destinies are connected with those of mankind. This is a homage which the Christian religion justly challenges, and which it alone merits. [Nature says to you, Love thyself alone ; domestic education says, Love your family ; the national, Love your country ; but Religion says, Love mankind without exception. She is better acquainted with our interests than our natural instinct is, or our parentage, or politics.] Human societies are not detached from each other like those of animals. The bees of France are not in the least affected

by the destruction of the hives in America; but the tears of mankind, shed in the New World, cause streams of blood to flow in the ancient continent. The religion which condemns love of ourselves, and enjoins the love of mankind, is not self-contradictory, as certain sophists have alleged; she exacts the sacrifice of our passions only to direct them towards the general felicity; and by inculcating upon us the obligation of loving all men, she furnishes us with the only real means of loving ourselves.

I could wish, therefore, that our political relations with all the nations of the world, might be directed towards a gracious reception of their subjects in the capital of the kingdom. Were we to expend only a part of what we lay out on foreign communications, we should be no great losers. The nations of Asia send no ambassadors out of their country, unless on very extraordinary occasions; and all nations of the earth seek to them. It is not by sending ambassadors in great state to neighbouring nations, that we conciliate or secure their friendship. The point is to give a kind reception to their subjects, properly so called; the weak, persecuted, and miserable. Our French refugees were the men who conveyed part of our skill and power to Prussia and Holland. How many unseen relations of commerce and national benevolence have been formed upon such graciousness of reception!

After having rendered the city of men wonderfully happy, XI would direct my attention to the embellishment and commodiousness of the city of stones. I would rear in it a multitude of useful monuments: I would extend along the houses, arcades as in Turin, and a raised pavement as in London, for the accommodation of foot-passengers; in the streets, where it was practicable, trees and canals as in Holland, for the facility of carriage; in the suburbs caravansaries, as in the cities of the east, for the entertainment, at a moderate expense, of travellers from foreign lands; towards the centre of the city, markets of vast extent, and surrounded with houses six or seven stories high, for the reception of the poorer sort, who will soon be at a loss for a place where to lay their head. I would introduce a great deal of variety into their plans and decorations. In the circular surrounding space I would dispose temples, halls of justice, public fountains; the principal streets should terminate in them. I would erect in the centre the statue of a good king; for it is impossible to place it in a

situation more honourable to his memory, than in the midst of the abundance enjoyed by his subjects.

I know of no one thing which conveys a more precise idea of the police of a city, and the felicity of its inhabitants, than the sight of its markets. I should like to see the most perfect harmony prevailing among our merchants, and the most complete contrasts among their wares. By removing the rivalities of commerce in the same sort of goods, those jealousies which produce so many quarrels would be prevented. It would give me pleasure to behold abundance there pouring out the treasure of all her horns pell-mell. Permission should be granted to sell there every sort of goods; and this privilege alone would destroy various species of monopoly.

I would erect but few temples; these however should be august, immense, with galleries on the outside and within, and capable of containing on festival days the third part of the population of Paris. The more that temples are multiplied in a state, the more is religion enfeebled. This has the appearance of a paradox; but look at Greece and Italy covered with church-towers, while Constantinople is crowded with Greek and Italian renegadoes. Independently of the political and even religious causes which produce these national depravations, there is one founded in Nature, the effects of which we have already recognised in the weakness of the human mind. It is this, That affection diminishes in proportion as it is divided among a variety of objects. The Jews, so astonishingly attached to their religion, had but one single temple, the recollection of which excites their regret to this day.

I would have amphitheatres constructed at Paris like those at Rome, for assembling the people, and of treating them from time to time with days of festivity. What a superb site for such an edifice is presented in the rising ground at the entrance into the Elysian Fields! How easy would it have been to hollow it down to the level of the plain in form of an amphitheatre, disposed into ascending rows of seats covered with green turf simply, having its ridge crowned with great trees, exalted on an elevation of more than four-score feet: what a magnificent spectacle would it have been to behold an immense people ranged round and round, like

one great family, eating, drinking, and rejoicing in the contemplation of their own felicity !

All these edifices should be constructed of huge blocks of stone, such as the ancients employed, and as becomes a city that is to last for ever. The streets and public squares should be planted with great trees of various sorts. Trees are the real monuments of nations. Time, which speedily impairs the works of man, only increases the beauty of those of Nature. To the trees our favourite walk the Boulevards is indebted for its principal charm. They delight the eye by their verdure ; they elevate the soul to heaven by the loftiness of their stems ; they communicate respect to the monuments which they shade by the majesty of their forms. They contribute, more than we are aware of, to rivet our attachment to the places we have inhabited. Our memory fixes on them as on points of union which have secret harmonies with the soul of man. They possess a commanding influence over the events of our life, like those which rise by the shore of the sea, and frequently serve as a direction to the pilot. The trees of our natal soil have a farther and most powerful attraction, when they are blended, as was the case among the ancients, with some religious idea, or with the recollection of some distinguished personage. Whole nations have attached their patriotism to this object.]

✧ A city, were it built completely of marble, would have to me a melancholy appearance, unless I saw in it trees and verdure : on the other hand a landscape, were it Arcadia, were it along the banks of the Alpheus, or did it present the swelling ridges of Mount Lyceum, would appear to me a wilderness if I did not see in it at least one little cottage. The works of Nature and of man mutually embellish each other. The spirit of selfishness has destroyed among us a taste for Nature. Our peasantry see no beauty in our plains but where they see the return of their labour. I one day met in the vicinity of the Abbey de la Trappe, on the flinty road of Notre Dame d'Apres, a countrywoman walking along with two large loaves of bread under her arm. It was in the month of May, and the weather inexpressibly fine. 'What a charming season it is!' said I. 'How beautiful are those apple-trees in blossom ! How sweetly those nightingales sing in the woods !'—'Ah !' replied she, 'I do n't mind nose-gays, nor these little squallers ! It is bread that we want.'

Indigence hardens the heart of the country people, and shuts their eyes. But the good folks of the town have no greater relish for Nature, because the love of gold regulates all their other appetites. If some of them set a value on the liberal arts, it is not because those arts imitate natural objects, but from the price to which the hand of great masters raises their productions. These know that it is not Nature but their own skill which is prized, their great aim is to display themselves. Hence they introduce a profusion of rich accessories into most of our monuments, while they frequently omit altogether the principal object.

Our populace we are told is destitute of patriotism. I can easily believe it, for everything is done that can be done to destroy this principle in them. For example, on the pediment of the beautiful church of St. Genevieve, an adoration of the cross is represented. You see indeed the patroness of Paris in bas-reliefs under the peristyle, in the midst of cardinals; but would it not have been more in character to exhibit to the people their humble patroness in her habit of shepherdess, in a little jacket and cornet, with her scrip, her crook, her dog, her sheep, her moulds for making cheese, and all the peculiarities of her age and condition, on the pediment of the church dedicated to her memory? To these might have been added a view of Paris, such as it was in her time. From the whole would have resulted contrasts and objects of comparison of the most agreeable kind. The people at sight of this rural scenery would have called to memory the days of old. They would have conceived esteem for the obscure virtues which are necessary to their happiness, and would have been stimulated to tread in the rough paths of glory which their lowly patroness trod before them, whom it is now impossible for them to distinguish in her Grecian robes, and surrounded by prelates.

The French Academy would be much more successful, if it aimed at fixing, by the charms of eloquence, the attention of the nation on our great men; did it attempt less, in the eulogiums which it pronounces to panegyryze the dead, than to satirize the living. In order to paint virtue, it is necessary to bring forward defects and vices, that conflict and triumph may be rendered conspicuous. The style employed in it is full of pomp and luxuriance. This kind of eloquence, vague and indecisive as it is, suits no one great man in par-

ticular, because it may be applied in general to all those who have run the same career. If you only change a few proper names in the eulogium of a general, you may comprehend in it all generals past and future. You will never find an academical eulogium in the hands of one of the common people. You might see them perhaps turning over those of Fontenelle, and a few others, if the persons celebrated in them had paid attention to the people while they lived ; but the nation takes pleasure in reading history.

Walking some time ago towards the quarter of the military school, I perceived at some distance, near a sand-pit, a thick column of smoke. I bent my course that way to see what produced it. I found, in a very solitary place, a good deal resembling that which Shakspeare makes the scene where the three witches appear to Macbeth, a poor woman sitting upon a stone. She was deeply engaged in reading an old book, close by a great pile of herbage which she had set on fire. I first asked her for what purpose she was burning those herbs ? She replied, that it was for the sake of the ashes, which she gathered up and sold to the laundresses ; that for this end she bought of the gardeners the refuse plants of their grounds, and was waiting till they were entirely consumed, that she might carry off the ashes, because they were liable to be stolen in her absence. After having thus satisfied my curiosity, she returned to her book, and read on with deep attention. Eagerly desirous to know with what book she filled up her hours of languor, I took the liberty to ask the title of it. 'It is the life of M. de Turenne,' she replied. 'Well, what do you think of him ?' said I. 'Ah !' replied she with emotion, 'he was a brave man, who suffered much uneasiness from a minister of state, while he was alive.' I withdrew, filled with increased veneration for the memory of M. de Turenne, who served to console a poor old woman in distress. (It is thus that the virtues of the lower classes of society support themselves on those of great men, as the feeble plants, which, to escape being trampled under foot, cling to the trunk of the oak.)

OF NOBILITY.

The ancient nations of Europe imagined that the most powerful stimulus to the practice of virtue was to ennoble the descendants of their virtuous citizens. They involved

themselves by this in very great inconveniences. For in rendering nobility hereditary, they precluded to the rest of the citizens the paths which lead to distinction. As it is the perpetual exclusive possession of a certain number of families, it ceases to be a national recompense, otherwise a whole nation would consist of nobles at length : which would produce a lethargy fatal to arts and handicrafts ; and this is actually the case in Spain, and part of Italy.

✕ Many other mischiefs necessarily result from hereditary noblesse, the principal of which is the formation, in a state, of two several nations, which at length have nothing in common between them ; patriotism is annihilated, and both hasten to a state of subjection. Such has been, within our recollection, the fate of Hungary, Bohemia, Poland, and even part of the provinces of our own kingdom, such as Britanny, where a nobility, insufferably lofty, and multiplied beyond all bounds, formed a class absolutely distinct from the rest of the citizens. It is well worthy of being remarked, that these countries, though republican, though so powerful, in the opinion of our political writers, from the freedom of their constitution, have been very easily subjected by despotic princes, who were the masters they tell us of slaves only. The reason is, that the people in every country prefer one sovereign to a thousand tyrants, and that their fate always decides that of their lordly oppressors. The Romans softened the unjust and odious distinctions between patricians and plebeians, by granting to these last privileges and employments of the highest respectability.

Means still more effectual were employed by that people to approximate the two classes of citizens ; particularly the practice of adoption. How many great men started up out of the mass of the people to merit this kind of recompense, as illustrious as those which country bestows, and still more addressed to the heart ! Thus did the Catos and the Scipios distinguish themselves, in hope of being ingrafted into patrician families. I do not know, but perhaps I am only betraying my own ignorance, that adoption ever was in use among us, unless between certain great lords, who from the failure of heirs of blood, were at a loss how to dispose of their vast possessions. I consider adoption as much preferable to nobility conferred by the state. It might be the means of reviving illustrious families, whose descendants are now languishing in abject

poverty. It would endear the nobility and people to each other. The privilege of bestowing the rights of adoption should be rendered a species of recompense to the noblesse themselves. Thus, for example, a poor man of family, who had distinguished himself, might be empowered to adopt one of the commonalty, who should acquire eminence. A man of birth would be on the look-out for virtue among the people; and a virtuous man of the commonalty would go in quest of a worthy nobleman as a patron. Such political bonds of union would be more powerful, more honourable, than mercenary matrimonial alliances, which, by uniting two individual citizens of different classes, frequently alienate their families. Nobility thus acquired would appear far preferable to that which public employments confer; for these being purchasable, from that very circumstance lose their respectability, and consequently degrade the nobility attached to them.

But taking it at the best, one disadvantage must ever adhere to hereditary nobility, namely, the eventual excessive multiplication of persons of that description. A remedy for this has been attempted among us, by adjudging nobility to various professions, such as maritime commerce. It may be a question, Whether the spirit of commerce can be perfectly consistent with the honour of a gentleman? Besides, What commerce shall he carry on who has got nothing? Must not a premium be paid to the merchant for admitting a young man into his counting-house to learn the first principles of trade? And where should so many poor men of noble birth find the means, who have not wherewithal to clothe their children? I have seen some of them in Brittany, the descendants of the most ancient families of the province, so reduced as to earn a livelihood by mowing down the hay of the peasantry for so much a day.

Would to God that all conditions were nobilitated, the profession of agriculture in particular! for it is that, above all others, of which every function is allied to virtue. To be a husbandman there is no need to deceive, flatter, degrade one's self, or do violence to another. He is not indebted for the profits of his labour to the vices or luxury of his age, but to the bounty of Heaven. He adheres to his country, at least by the little corner of it which he cultivates. (If the condition of the husbandman were ennobled, many benefits to the

inhabitants of the kingdom would result from it. Nay, it would be sufficient were it not considered as ignoble.

OF AN ELYSIUM.

The hereditary transmission of nobility is subject to a farther inconvenience ; namely, that man who sets out with the virtues of a Marius finishes the career loaded with all his vices. To distinguish superior worth, let the rewards of virtue be withheld till after death.

Death affixes the last seal to the memory of man. It is well known of what weight the decisions were which the Egyptians pronounced upon their citizens after life was terminated. Then too it was that the Romans sometimes exalted theirs to the rank of demigods, and sometimes threw them into the Tiber. The people, in default of priests and magistrates, still exercise among us a part of this priesthood. I have often stood still of an evening, at sight of a magnificent funeral procession, not so much to admire the pomp of it, as to listen to the judgment pronounced by the populace on the prince whose obsequies were celebrating. I have heard the question asked, Was he a good master ? Was he fond of his wife and children ? Was he a friend to the poor ? The people insist particularly on this last question, because, being principally influenced by the call of Nature, they distinguish in the rich hardly any other virtue than beneficence. I have heard this reply given : ‘ Oh ! he never did good to any one ; he was an unkind relation, a harsh master.’ I have heard them say, at the interment of a farmer-general, who left behind him more than half a million sterling : ‘ He drove away the country poor from his castle with fork and flail.’ On such occasions the spectators cursed the memory of the deceased.

Death alone can ensure reputation, and nothing short of religion can consecrate it. Our grandees are abundantly aware of this. Hence the sumptuousness of their monuments in our churches ; on which, as many imagine, their virtues are portrayed in brass and marble. But, thanks to the allegorical representations of our artists, to the Latin inscriptions of our *litterati*, the people know nothing about the matter ; and their only reflection at sight of them is, that all this must have cost an enormous sum of money, which might have been employed to much better advantage.

Religion alone can consecrate the memory of virtue. The

celebrated Frederic of Prussia did not overlook this. As the Protestant religion, the general profession of his kingdom, excludes from the churches the images of the saints, he supplied their place with the portraits of distinguished officers who had fallen in his service. The first time I looked into the churches at Berlin, I was not a little astonished to see the walls adorned with the portraits of officers in their uniform. Beneath, there was an inscription indicating their names, their age, the place of their birth, and the battle in which they had been killed. There is likewise subjoined, if my recollection is accurate, a line or two of eulogium. The military enthusiasm kindled by this sight is inconceivable.

Adala I would have it made a rule that no citizen should be interred in the church. Cyrus, the sovereign of the greatest part of Asia, ordered that his body should be interred in the open country, so that the elements of it might be quickly united to those of Nature, and contribute anew to the formation of her beautiful works. This sentiment was worthy of the sublime soul of Cyrus. Tombs in every country, especially those of great kings, are the most endeared monuments of nations. The savages consider those of their ancestors as titles to the possession of the lands which they inhabit. 'This country is ours,' say they; 'the bones of our fathers are here laid to rest.' When forced to quit it, they dig them up with tears, and carry them off with every token of respect.

The Turks erect their tombs by the side of the highways, as the Romans did. The Chinese make theirs enchanted spots, which inspire a profound and delicious melancholy, not only from the natural effect of their decorations, but from the moral sentiment excited in us by tombs, which are monuments erected on the confines of two worlds.

Our great ones then would lose nothing of the respect which they wish to attach to their memory, were they to be interred in public receptacles of the dead adjoining to the capital. A magnificent sepulchral chapel might be constructed in the midst of the burying-ground, devoted solely to funereal obsequies, the celebration of which frequently disturbs the worship of God in parish churches. Artists might give full scope to their imagination in the decorations of such a mausoleum; and the temples of humility and truth would no longer be profaned by the vanity and falsehood of monumental epitaphs.

While each citizen should be left at liberty to lodge himself, agreeably to his own fancy, in this last and lasting abode, I would have a large space selected, not far from Paris, consecrated by every solemnity of religion to be a general receptacle of the ashes of such as may have deserved well of their country.

The services which may be rendered to our country are infinite and various. We hardly acknowledge any but what are derived from formidable qualities, such as valour. We revere that only which terrifies us. The tokens of our esteem are frequently testimonies of our weakness. We are brought up to a sense of fear only, and not of gratitude.

✕I have often felt astonishment at our indifference about the memory of those of our ancestors who introduced useful trees in the country, the fruits and shade of which are to this day so delicious. The names of those benefactors are almost unknown; their benefits are however perpetuated from age to age. The Romans did not act in this manner. Pliny tells us, that of the eight species of cherry known at Rome in his time, one was called the Plinian, after the name of one of his relations, to whom Italy was indebted for it. He informs us that it was Lucullus who transplanted from the kingdom of Pontus the first cherry-trees into Italy, from whence they were propagated in less than 120 years all over Europe, England not excepted, which was then peopled with barbarians. They were perhaps the first means of the civilization of that island, for the first laws always spring up out of agriculture; and for this very reason it is that the Greeks gave to Ceres the name of *Legislatrix*. Assuredly, if I wished to have my name perpetuated, I would rather have it affixed to a fruit in France than to an island in America. The people in the season of that fruit would recall my memory with tokens of respect. My name, preserved in the baskets of the peasantry, would endure longer than if it were engraved on columns of marble.

✕The benefit of a useful plant is, in my opinion, one of the most important services a citizen can render to his country. Foreign plants unite us to the nations from whence they come; they convey to us a portion of their happiness and of their genial suns. I would begin then with erecting the first monuments of public gratitude to those who have introduced among us the useful plants; for this purpose I would select

one of the islands of the Seine, in the vicinity of Paris, to be converted into an Elysium. I would plant this extensive district with the trees, shrubbery, and herbage, with which France has been enriched for ages past. Under their shade, and amidst carpets of variegated verdure, should be reared the monuments of those who transplanted them into France. There too should be displayed the urn of the unknown traveller, who adorned to endless generations the humble window of his obscure habitation with the brilliant colours of Aurora, by transplanting thither the nun of Peru.*

✕ On advancing into this delicious spot, we should behold under domes and porticoes the ashes and busts of those who, by the invention of useful arts, have taught us to avail ourselves of the productions of Nature, and who by their genius have spared us the necessity of long and painful labours. There would be no occasion for epitaphs. The figures of the implements employed in weaving stockings; of those used in the twisting of silk, and in the construction of the windmill, would be monumental inscriptions as august, and as expressive, on the tombs of their inventors, as the sphere inscribed in the cylinder on that of Archimedes. There might one day be traced the aerostatic globe on the tomb of Mongolfier; but it would be proper to know beforehand whether that strange machine, which elevates men into the air by means of fire, or gas, shall contribute to the happiness of mankind; for the name of the inventor of gunpowder himself, were we capable of tracing it, could not be admitted into the retreats of the benefactors of humanity.

On approaching the centre of this Elysium, we should meet with monuments still more venerable, of those who by their virtue have transmitted to posterity fruits far more delicious than those of the vegetables of Asia, and who have called into exercise the most sublime of all talents. There should be placed the monuments and the statues of the generous Duquesne, who himself fitted out a squadron, at his sole expense, in the defence of his country; of the sage Catinat, equally tranquil in the mountains of Savoy and in the hum-

* I would contemplate the monument of that man, were it but a simple tile, with more respect than the superb mausolea which have been reared in many places of Europe and of America, in honour of the inhuman conquerors of Mexico and Peru. More historians than one have given us their eulogium, but divine Providence has done them justice. They all died a violent death, and most of them by the hand of the executioner.

ble retreat of St. Gratian ; and of the heroic Chevalier d'Assas, sacrificing himself by night for the preservation of the French army in the woods of Klosterkam.

There should be the illustrious writers, who inflamed their compatriots with the ardour of performing great actions. There we should see Anyot leaning on the bust of Plutarch ; and thou, who hast given at once the theory and the example of virtue, divine author of *Telemachus* ! we should revere thy ashes and thy image, in an image of those Elysian fields which thy pencil has delineated in such glowing colours.

I would likewise give a place to the monuments of eminent women, for virtue knows no distinction of sex. There should be reared the statues of those who, with all the charms of beauty, preferred a laborious and obscure life to the vain delights of the world ; of matrons who re-established order in a deranged family ; who, faithful to the memory of a husband frequently chargeable with infidelity, preserved inviolate the conjugal vow, even after death had cancelled the obligation, and devoted her youth to the education of the dear pledges of a union now no more : and finally, the venerable effigies of those who attained the highest pinnacle of distinction by the very obscurity of their virtues. Thither should be transported the tomb of a lady of Lamoignon, from the poor church of Saint Giles, where it remains unnoticed : its affecting epitaph would render it still more worthy of occupying this honourable station than the chisel of Girardon, whose masterpiece it is : in it we read that a design had been entertained to bury her in another place ; but the poor of the parish, to whom she was a mother all her life long, carried it off by force, and deposited it in their church : they themselves would undoubtedly transport the remains of their benefactress, and resort to this hallowed spot to display them to the public veneration.

Here patriot-bands, who for their country bled ;
 Priests, who a life of purest virtue led ;
 Here bards sublime, fraught with ethereal fire,
 Whose heavenly strains outvied Apollo's lyre ;
 Divine inventors of the useful arts ;
 All those whose generous and expansive hearts,
 By goodness sought to purchase honest fame,
 And dying left behind a deathless name.

There I would have, scattered about, monuments of every kind, apportioned to various degrees of merit : I would not

nave them crowded together, as in a repository, but disposed with taste : neither would I have them all of white marble, as if they came out of the same quarry, but of marbles and stones of every colour. There would be no occasion, through the whole extent of this vast enclosure, for the application of the line, for digging up the ground, for grass-plots, for trees cut into shape, and fantastically trimmed, nor anything resembling what is to be seen in our gardens. For a similar reason, I would have no Latin inscriptions, nor mythological expressions, nor anything that savoured of the academy.* Still less would I admit of dignities or honours, which call to remembrance the vain ideas of the world ; I would retrench from them all the qualities which are destroyed by death ; no importance should there be assigned but to good actions, which survive the man and the citizen, and are the only titles that posterity cares for, and that God recompenses. The inscriptions should be simple, and naturally suggested by each particular subject. The living should not uselessly talk to the dead, and to inanimate objects, as is the case in our epitaphs ; but the dead should speak to the living for their instruction, as among the ancients. These correspondences of an invisible to a visible nature, of a time remote to the time present, convey to the soul the celestial extension of infinity, and are the source of the delight which ancient inscriptions inspire.

I would insist that in the figures introduced there should be displayed no air of insolence ; no dishevelled locks flying about in the wind, like those of the angel sounding the resurrection trumpet, no theatrical grief, and no violent tossing of the robes ; no mythological attributes, which convey nothing instructive to the people. Every personage should there appear with his appropriate badge of distinction.

These statues of virtuous citizens ought to be fully as respectable as those of the gods of paganism, and unques-

* Had St. Pierre, in the course of his travels, come over to this island, and visited Stowe, he would have found his idea of an Elysium anticipated, and upon no mean scale, by the great Lord Cobham, who has rendered every spot of that terrestrial paradise sacred to the memory of departed excellence. What would have given our author peculiar satisfaction, the parish church stands in the centre of the garden ; hence the people have unrestrained access to it. The monuments are for the most part patriotic, without regard to the distinctions of rank and fortune, except as allied to virtue ; and the best inscriptions are in plain English, and humble prose.

tionably more interesting than that of the antique grinder or gladiator. But our artists should study to convey, as the ancients did, the characters of the soul in the attitude of the body, and in the traits of the countenance, such as penitence, hope, joy, sensibility, innocence. These are peculiarities of Nature which never vary, and always please, whatever be the drapery. Nay, the more contemptible the occupations and garb of such personages are, the more sublime will the expression of their virtues appear.

There should be on those tombs no skeletons, no bats' wings, no Time with his scythe, none of those terrifying attributes which inspire us with horror at the thought of death, that last benefit of Nature: but we should contemplate on them symbols which announce a happy and immortal life; vessels shattered by the tempest arriving safe in port; doves taking their flight towards heaven, and the like.

The sacred effigies of virtuous citizens, crowned with flowers, with the characters of felicity, of peace, and of consolation in their faces, should be arranged towards the centre of the island, around a vast mossy down, under the trees of the country. From the middle of that down should ascend a magnificent temple in form of a rotunda. It should be surrounded with a peristyle of majestic columns, as was formerly at Rome the *Moles Adriani*. But I could wish it to be much more spacious. On the frieze these words might appear:—‘To the love of the human race.’

In the centre I would have an altar simple and unornamented, at which, on certain days of the year, divine service might be celebrated. No production of sculpture nor of painting, no gold nor jewels, should be deemed worthy of decorating the interior of this temple; but sacred inscriptions should announce the kind of merit which there received the crown. All those who might repose within the precincts undoubtedly would not be saints. But over the principal gate, on a tablet of white marble, these divine words might meet the eye:—‘Her sins, which were many, are forgiven; for she loved much.’

On another part of the frieze, the following inscription, unfolding the nature of our duties, might be displayed:—‘Virtue is an effort made upon ourselves, for the good of men, in the view of pleasing God only.’

To this might be subjoined the following, very much cal-

culated to repress our ambitious emulation :—‘ The smallest act of virtue is of more value than the exercise of the greatest talents.’

On other tablets might be inscribed maxims of trust in the divine Providence, extracted from the philosophers of all nations, such as the following, borrowed from the modern Persians :—‘ When affliction is at the height, then we are the most encouraged to look for consolation. . The narrowest part of the defile is at the entrance of the plain.’*

And that other of the same country :—‘ Whoever has cordially devoted his soul to God, has effectually secured himself against all the ills which can befall him, both in this world and in the next.’

There might be inserted some of a philosophic cast, on the vanity of human things, such as the following :—‘ Estimate each of your days by pleasures, by loves, by treasures, and by grandeurs ; the last will accuse them all of vanity.’

Or that other, which opens to us a perspective of the life to come :—‘ He who has provided light for the eye of man, sounds for his ear, perfumes for his smell, and fruits for his palate, will find the means of one day replenishing his heart, which nothing here below can satisfy.’

And that other, which inculcates charity towards men from the motives of self-interest :—‘ When a man studies the world, he prizes those only who possess sagacity ; but when he studies himself, he esteems only those who exercise indulgence.’

I would have the following inscribed round the cupola in letters of antique bronze :—‘ A new commandment I give unto you, that ye love one another ; as I have loved you, that ye also love one another.’

To decorate this temple externally with a becoming dignity, no ornament would be necessary except those of Nature. The first rays of the rising and the last of the setting sun would gild its cupola, towering above the forests : in the day time the fires of the south, and by night the lustre of the moon, would trace its majestic shadow on the spreading down : the Seine would repeat the reflexes of its flowing stream. In vain would the tempest rage around its enormous

* Chardin’s Palace of Isphahan.

vault ; and when the hand of Time should have bronzed it with moss, the oaks of the country should issue from its antique cornices, and the eagles of heaven, hovering round and round, would resort thither to build their nests.

Neither talents, birth, nor gold, should constitute a title to the honour of a monument in this patriotic and holy ground. But it will be asked, Who is to judge and to decide the merits of the persons whose ashes are to be there deposited ? The king alone should have the power of decision, and the people the privilege of reporting the cause. It should not be sufficient for a citizen to obtain this kind of distinction, that he had cultivated a new plant in a hot-house, or even in his garden ; but it should be requisite to have it naturalized in the open field, and its fruit carried to the public market. It ought not to be deemed sufficient that the model of an ingenious machine was preserved in the collection of an artist, and approved by the Academy of Sciences ; it should be required to have the machine itself in the hands of the people, and converted to their use. The merit of a naval or military commander should be ascertained, not by the report of gazettes, but by the suffrages of the sailors or soldiery.

The people, in truth, distinguish hardly any other virtue in the citizen except beneficence : they consult only their own leading want ; but their instinct on this article is conformable to the Divine Law : for all the virtues terminate in that, even those which appear the most remote from it ; and supposing there were rich men who meant to captivate their affections by doing them good, that is precisely the feeling with which we purpose to inspire them. They would fulfil their duties, and the lofty and the low conditions of humanity would be reduced to a state of approximation. From an institution of this kind would result the re-establishment of one of the laws of Nature, of all others the most important to a nation ; I mean an inexhaustible perspective of infinity, as necessary to the happiness of a whole nation as to that of an individual. What an august tribunal might be formed of bishops eminent for their piety, of upright magistrates, of celebrated commanders of armies, to examine their several pretensions ! What memoirs might one day appear, proper to create an interest in the minds of the people, who see nothing in their library but the sentences of death pronounced on illustrious criminals, or the lives of saints which are far above their sphere ! This

establishment, which might be formed undoubtedly in a manner very superior to the feeble sketch I have presented of it, would serve to bring the higher conditions of life into contact with the lower; it would allure foreigners to the capital, by holding out to them the right of a citizenship illustrious and immortal. It would unite, in a word, religion to patriotism, and patriotism to religion, the mutual bonds of which are on the point of being torn asunder. It would be attended with no expense to the state, but might be reared and kept up by the revenue of some rich abbey, thus consecrated to religion and to the rewards of virtue. It should not become, like the monuments of modern Rome, and even many of our own royal monuments, an object of filthy lucre to individuals, who sell the sight of them to the curious. Particular care would be taken not to exclude the people, because meanly habited; nor to hunt out of it, as from our public gardens, poor and honest artisans in jackets, while well-dressed courtezans flaunt about with effrontery in their great alleys: the lowest of the commonalty might enter it at all seasons. To you, O ye miserable of all conditions, the sight of the friends of humanity should of right appertain; and your patrons are henceforth nowhere but among the statues of virtuous men! There, a soldier at sight of Catinat would learn to endure calumny. There, a girl of the town, sick of her infamous profession, would with a sigh cast her eyes on the ground, on beholding the statue of modesty approached with honour and respect: but at sight of that of a female of her own condition reclaimed to the paths of virtue, she would raise them toward Him who preferred repentance to innocence.

It may be objected, that our poorer sort would soon spread destruction over all those monuments; and it must indeed be admitted, they seldom fail to treat in this manner those which do not interest them, but respect monuments destined to their use. They would soon take the elysium of their country under their protection, and watch over it with zeal much more ardent than that of military guards. Besides, methods might be devised to render that spot respectable and dear to them. It ought to be rendered an inviolable asylum to the unfortunate; for example, to fathers who have incurred the debt of the month's nursing of a child; and to those who have committed venial and inconsiderate faults; no personal arrest should take place there, except by an express warrant

from the king. Laborious families out of employment might here be directed to address themselves. There ought to be a strict prohibition to make it a place of alms-giving, but an unbounded permission to do good in it. Persons of virtue would resort thither in quest of proper objects in whose behalf they might employ their credit; others, from respect to the memory of some illustrious personage, would give a repast at the foot of his statue to a family of poor people. There the rich would be instructed really to practise virtue, and the people to know it. The nation would learn their great duties, and be assisted in forming a just idea of true greatness. They would behold the homage presented to the memory of virtuous men, and the offerings tendered to the DEITY, ultimately applied to the relief of the miserable.

Such repasts would recall to our remembrance the love-feasts of the primitive Christians, and the saturnalia of death, toward which every day is carrying us forward, by speedily reducing us all to an estate of equality, will efface every other difference but that of the good we shall have done in life.

OF THE CLERGY.

If our poor are sometimes partakers of some wretched ecclesiastical distribution, the relief they thence derive, so far from delivering them out of their misery, only serves to continue them in it. What landed property, however, has been bequeathed to the church expressly for their benefit! Why then are not the revenues distributed in sums sufficiently large to rescue annually from indigence at least a certain number of families? The clergy allege that they are the administrators of the goods of the poor; but the poor are neither idiots nor madmen to stand in need of administrators. I shall push this reflection no farther; priests are by divine right the agents of the poor, but the king alone is the natural administrator. As indigence is the principal cause of the vices of the people, opulence may produce, in its turn, irregularities in the clergy; and this has been abundantly proved.

The world at this day looks on most priests with an eye of envy; shall I say of hatred? But they are the children of their age, just like other men. The vices which are laid to their charge belong partly to their nation, partly to the times in which they live, to the political constitution of the

state, and to their education. Ours are Frenchmen like ourselves ; they are our kinsmen, frequently sacrificed to our own fortune through the ambition of our fathers. Were we charged with the performance of their duties, we should frequently acquit ourselves worse than they do. I know of none so painful, none so worthy of respect, as those of a good ecclesiastic.

I do not speak of those of a bishop, who exercises a vigilant care over his diocese, who institutes judicious seminaries of instruction, who maintains regularity and peace in communities, who resists the wicked and supports the weak, who is always ready to succour the miserable, and who, in this age of error, refutes the objections of the enemies of the faith by his own virtues. He has his reward in the public esteem. I say nothing of those of a parish minister, which, from their importance, sometimes attract the attention of kings ; nor of those of a missionary advancing to the crown of martyrdom. The conflicts of this last frequently endure but for a single day, and his glory is immortal. But I speak of those of a simple and obscure parish drudge, to whom no one pays the least attention. He must sacrifice the pleasures and the liberty of his juvenile days to irksome and painful studies ; he is obliged to support all his life the exercise of continency on a thousand occasions which endanger the loss of it. The world honours theatrical virtues only, and the victories of a single moment. But to combat day after day an enemy lodged within the fortress, and who makes his approaches under the disguise of a friend ; to repel incessantly, without a witness, without glory, without applause, the most impetuous of passions and the gentlest of propensities—this is not easy.

Conflicts of another kind await him from without. He is daily called upon to expose his life to the attack of epidemical distempers. He is obliged to confess, with his head on the same pillow, persons attacked with the small-pox, with the putrid and purple fever. This obscure fortitude is far superior to the courage of a soldier. The military man combats in the view of armies, animated with the noise of cannon and drums ; he presents himself to the stroke of death as a hero. But the priest devotes himself to it as a victim. What fortune can this last promise himself from his labours ? In many cases, a precarious subsistence at most ! Besides, sup-

posing him to have acquired wealth, he cannot transmit it to his descendants. He beholds all his temporal hopes expire with him. What indemnification does he receive from men ? To be called upon many a time to administer the consolations of religion to persons who do not believe it ; to be the refuge of the poor, with nothing to give them ; to be sometimes persecuted for his very virtues ; to see his conflicts treated with contempt, his best intentioned actions misinterpreted into artifice, his virtues transformed into vices, his religion turned into ridicule. Such are the duties imposed, and such the recompense which the world bestows on the men whose lot it envies.

This is what I have assumed the courage to propose, for the happiness of the people, and of the principal orders of the state, in so far as I have been permitted to submit my ideas to the public eye. Should some great minister, animated with a noble ambition to procure for us internal happiness, and to extend our power externally, have the courage to undertake a re-establishment of things, he must in his course of procedure imitate that of Nature. She acts in every case slowly, and by means of reactions. I repeat it, the cause of the prodigious power of gold, which has robbed the people at once of their morality and subsistence, is in the venality of public employments ; that of the beggary of seven millions of subjects consists in the enormous accumulation of landed and official property ; that of female prostitution is to be imputed, on the one hand, to extreme indigence ; and on the other, to the celibacy of two millions of men : the prejudices of the nobility are kept alive by the resentments of those who want the advantage of birth ; and all other evils, physical and intellectual, spring up out of the misery of the people. It is the indigence of the people which produces such swarms of players, courtezans, highwaymen, incendiaries, licentious scholars, calumniators, flatterers, hypocrites, mendicants, kept mistresses, quacks of all conditions, and that infinite multitude of corrupted wretches, who, incapable of coming to anything by their virtues, endeavour to procure bread and consideration by their vices. In vain will you oppose to these plans of finance, projects of equalization of taxes and tithes, of ordonnances of police, of arrears of parliament ; all your efforts will be fruitless. The indigence of the people is a mighty river, which is every year collecting

an increase of strength, sweeping away before it every opposing mound, and which will issue in a total subversion of order and government.

To this physical cause of our distresses must be added another, purely moral! I mean our education. If it be the most important of our abuses, it is the most easily susceptible of reformation; and this reform appears to me so absolutely necessary, that without it all the rest goes for nothing.

STUDY FOURTEENTH.

OF EDUCATION.

‘To what higher object,’ says Plutarch,* ‘could Numa have directed his attention, than to the culture of early infancy, and to uniformity in the treatment of young persons; in the view of preventing the collision of different manners, and the turbulency of spirit arising from diversity of nature? Thus he proposed to harmonise the minds of men, in a state of maturity, from their having been entrained in childhood in the same habits of order, and cast into the same mould of virtue. This, independently of other advantages, greatly contributed likewise to the support of the laws of Lycurgus; for respect to the oath, by which the Spartans had bound themselves, must have produced a much more powerful effect, from his having by early instruction and nurture *dyled in the wool*, if I may use the expression, the morals of the young and made them suck in with the milk from their nurse’s breast the love of his laws and institutions.’

Here is a decision which completely condemns our mode of education, by pronouncing the eulogium of that of Sparta. I do not hesitate to ascribe to our modern education, the restless, ambitious, spiteful, pragmatistical, and intolerant spirit of most Europeans; its effects are visible in the miseries of the nations; and those which have been most agitated internally and externally are precisely the nations among which our boasted style of education has flourished the most. The truth of this may be clearly ascertained by stepping from

* Comparison of Numa and Lycurgus.

country to country, from age to age. Politicians have imagined that they could discern the cause of public misfortunes in the different forms of government. But Turkey is quiet, and England is frequently in a state of agitation. All political forms are indifferent to the happiness of a state, provided the people are happy; we might have added, and provided the children are so likewise.

The philosopher Laloubere, envoy from Louis XIV. to Siam, says, in the account he gives of his mission, that the Asiatics laugh us to scorn when we boast to them of the excellence of the Christian religion, as contributing to the happiness of states. They ask, on reading our histories, How is it possible that our religion should be so humane, while we wage war ten times more frequently than they do? What would they say, then, did they see our perpetual lawsuits, the malicious censoriousness and calumny of our societies, the jealousy of corps, the quarrels of the populace, the duels of the better sort, and our animosities of every kind, nothing similar to which is to be seen in Asia, in Africa, among the Tartars or savages, on the testimony of missionaries themselves? I can discern the cause of all these particular and general disorders in our ambitious education. When a man has drunk, from infancy upward, into the cup of ambition, the thirst of it cleaves to him throughout life, and degenerates into a burning fever at the very feet of the altars. This is not assuredly occasioned by religion.

There are but two passions in the heart of man, love and ambition. Civil laws denounce the severest punishment against the excesses of the first; but these same laws meet the second more than half way; they everywhere propose to it prizes, rewards, and honours. Thus the world forms its judgments; but religion, ever conformable to Nature, pronounces a very different decision on the characters of these two passions. Jesus invites the communications of the frail Samaritan woman, he pardons the adulteress, he absolves the female offender who bathed his feet with her tears; but, in Luke xi. 43, &c. he inveighs against the ambitious. He declares, that notwithstanding their empty honours in this world, harlots should go before them into the kingdom of God. He cautions us, in many places, to be on our guard against them, and intimates that we should know them by their fruits. In pronouncing decisions so different from ours,

He judges our passions according to their natural adaptation. The first involves the distress of only two guilty persons, but the second affects the happiness of mankind.

Virtue and ambition are absolutely incompatible. The glory of ambition is to mount, that of virtue to descend. Observe how JESUS CHRIST reprimands his disciples, when they asked him who should be the first among them. He takes a little child, and places him in the midst. Ah ! when He recommends the humility so suitable to our frail and miserable condition, it is because He did not consider that power, even supreme, was capable of constituting our happiness in this world ; He did not confer the superiority over the rest on the disciple whom he loved the most ; but as a reward to the love of him who had been faithful unto death, He bequeathed to him, with his dying breath, his own mother as a legacy.

A pretended emulation instilled into children renders them for life intolerant, vainglorious, tremblingly alive to the slightest censure, or to the meanest token of applause. They are trained to ambition, we are told, in order to their prospering in the world ; but the cupidity natural to the human mind is more than sufficient for the attainment of that object. Those who are incapable of rising by their talents, endeavour to insinuate themselves into the good graces of their masters by flattery, and to supplant their equals by calumny. If these means succeed not, they conceive an aversion for the objects of their emulation, which, to their comrades, has all the value of applause, and becomes to themselves a perpetual source of depression, chastisement, and tears.

This is the reason that so many grown men endeavour to banish from their memory the times and the objects of their early studies, though it be natural to the heart of man to recollect with delight the epochs of infancy. I have no doubt that those disgusts of early education extend a most baleful influence to that love with which we ought to be animated towards religion, because its elements, in like manner, are displayed only through the medium of gloom, pride, and inhumanity.

The plan of most masters consists above all in composing the exterior of their pupils. They form, on the same model, a multitude of characters which Nature had rendered essentially different. One will have his disciples to be grave and

stately, as if they were so many little presidents; others, and they are the most numerous, wish to make theirs alert and lively. One of the great burdens of the lesson is an incessant fillip of: 'Come on, make haste, don't be lazy.' To this impulsion simply I ascribe the general giddiness of our youth, and of which the nation is accused. It is the impatience of the master which in the first instance produces the precipitancy of the scholars. It afterwards acquires strength in the commerce of the world, from the impatience of the women. But, through the progress of human life, is not reflection of much higher importance than promptitude? How many children are destined to fill situations which require seriousness and solemnity? Is not reflection the basis of prudence, temperance, wisdom, and of most of the other moral qualities? For my own part, I have always seen honest people abundantly tranquil, and rogues always alert.

A child influenced by the emulation of schools, must renounce it on his entry into the world, if he means to be supportable to his equals, and to himself? If he aims only at his own advancement, will he not be afflicted at the prosperity of another? Will he not be liable to have his mind torn with aversions, jealousies, and desires, which must deprave it, both physically and morally? Do not philosophy and religion impose on him the necessity of daily exertion, to eradicate those faults of education? The world itself obliges him to mask their hideous aspect. Here is a fine perspective opened to human life, in which we are constrained to employ one half our days in destroying, with a thousand painful efforts, what had been raising up in the other with so many tears and so much parade.

It was Charlemagne, we are told, who instituted our course of studies; and some say it was in the view of dividing his subjects, and of giving them employment. He has succeeded in this to a miracle. Seven years devoted to *humanity* or *classical learning*, two to *philosophy*, three to *theology*, twelve years of languor, of ambition, and of self-conceit; without taking into the account the years which well-meaning parents double upon their children, to make sure work of it, as they allege. I ask whether, on emerging thence, a student is, according to the denomination of those respective branches of study, more *humane*, more of a *philosopher*, and *believes* more

in God, than an honest peasant who has not been taught to read? What good purpose then does all this answer to the greatest part of mankind? What benefit do the majority derive from this irksome course, on mixing with the world, towards perfecting their own intelligence, and even towards purity of diction. We have seen, that the classical authors themselves have borrowed their illumination only from Nature, and that those of our own nation who have distinguished themselves the most in literature and in the sciences, such as Descartes, Montagne, Rousseau, and others, have succeeded only by deviating from the track which their models pursued, and frequently by pursuing the directly opposite path.

I acknowledge it is a fortunate circumstance for many children who have wicked parents, that there are colleges; they are less miserable there than in their father's house. The faults of masters, being exposed to view, are in part repressed by the fear of public censure; but it is not so as to those of their parents. Is it credible, that in society, the men of which all moralists allow to be corrupted, in which the citizens maintain their ground only by the terror of the laws, or by the fear which they have of each other, feeble and defenceless children should not be abandoned to the discretion of tyranny? Nothing can be conceived so ignorant, and conceited, as the greatest part of tradesmen; among them it is that folly shoots out spreading and profound roots. You see a great many of this class, both men and women, dying of apoplectic fits, from a too sedentary mode of life; from eating beef, and swallowing strong broths, when indisposed, without suspecting for a moment that such a regimen was pernicious. The regimen of their unfortunate children resembles that which they employ where their own health is concerned; they form them to melancholy habits; all that they make them learn, up to the Gospel itself, is with the rod over their head; they fix them in a sedentary posture all the day long, at an age when Nature is prompting them to stir about, for the purpose of expanding their form. Be good children, is the perpetual injunction; and this goodness consists in never moving a limb.) A woman of spirit, who was fond of children, took notice one day, at the house of a shopkeeper in St. Denis Street, of a little boy and girl who had a very serious air. 'Your children are very grave,' said she to the mother.—'Ah!

Madam,' replied the sagacious shopdame, 'it is not for want of whipping if they are not so.'

Children rendered miserable in their sports and studies, become hypocritical and reserved before their fathers and mothers. At length however they acquire stature. The daughter commits an imprudence, and is driven from her father's house ; the son enlists for a soldier. The parents are ready to go distracted. We spared nothing, say they, to procure them the best of education. Fools ! you forget the essential point ; to teach them to love you.

They justify their tyranny by that cruel adage : *Children must be corrected ; human nature is corrupted.* They do not perceive that they themselves, by their excessive severity, stand chargeable with the corruption, and that in every country where fathers are good, the children resemble them.

I could demonstrate, by a multitude of examples, that the depravation of our most notorious criminals began with the cruelty of their education. If human nature were corrupted, as is alleged by those who arrogate to themselves the power of reforming it, children could not fail to add a new corruption to that which they find already introduced into the world, upon their arrival in it. Human society would accordingly speedily reach the term of its dissolution. [But children, on the contrary, protract and put off that fatal period, by the introduction of new and untainted souls. It requires a long apprenticeship to inspire them with a taste for our passions and extravagances.]

× On examining the nest of a bird, we find in it not only the nutriments most agreeable to the young, but, from a multitude of other precautions, it is easy to discern that those who constructed it collected around their brood all the intelligence and benevolence of which they were capable. The father too sings at a little distance from their cradle, prompted rather, as I suppose, by the solitudes of paternal affection than those of conjugal love ; for this last sentiment expires in most as soon as the process of hatching begins. Were we to examine under the same aspect the schools of the young of the human species, we should have a very indifferent idea of the affection of their parents. Rods, whips, stripes, cries, tears, are the first lessons given to human life : we have here and there, it is true, a glimpse of reward amidst so many chastisements ; but, symbol of what awaits them

in society, the pain is real and the pleasure only imaginary.

Of all sensible beings, the human species is the only one whose young are brought up and instructed by dint of blows. I would not wish for any other proof of an original depravation of mankind. The European brood, in this respect, surpasses all the nations of the globe, as they likewise do in wickedness. We have already observed with what gentleness savages rear their children, and what affection the children bear to their parents in return.

➤ The Arabs extend their humanity to the very horses: they never beat them; they manage them by means of kindness and caresses, and render them so docile, that there are no animals of the kind in the whole world once to be compared with them in beauty and in goodness. They do not fix them to a stake in the fields, but suffer them to pasture at large around their habitation, to which they come running the moment that they hear the sound of their master's voice. Those tractable animals resort at night to their tents, and lie down in the midst of the children, without ever hurting them in the slightest degree. If the rider happens to fall while coursing, his horse stands still instantly, and never stirs till he has mounted again. (These people, by the irresistible influence of a mild education, have acquired the art of rendering their horses the first coursers of the universe.)

It is impossible to read without being melted into tears, what is related on this subject by the virtuous Consul d'Hervey, in his journey to Mount Lebanon. The whole stock of a poor Arabian of the desert consisted of a most beautiful mare. The French consul at Said offered to purchase her, with an intention to send her to his master, Louis XIV. The Arab, pressed by want, hesitated a long time, but at length consented, on condition of receiving a very considerable sum, which he named. The consul, not daring without instructions to give so high a price, wrote to Versailles for permission to close the bargain on the terms stipulated. Louis XIV. gave orders to pay the money. The consul immediately sent notice to the Arab, who soon after made his appearance, mounted on his magnificent courser, and the gold which he had demanded was paid down to him. The Arab, covered with a miserable rug, dismounts, looks at the money; then, turning his eyes to the mare, he sighs, and thus accosts her: 'To

whom am I going to yield thee up? To Europeans, who will tie thee close, who will beat thee, who will render thee miserable: return with me, my beauty, my darling, my jewel! and rejoice the hearts of my children!’ As he pronounced these words, he sprung upon her back, and scampered off towards the desert.

If with us fathers beat their children, it is because they love them not; if they send them abroad to nurse, as soon as they come into the world, it is because they love them not; if they place them, as soon as they have acquired a little growth, in boarding-schools and colleges, it is because they love them not; if they procure for them situations out of their state, out of their province, it is because they love them not; if they keep them at a distance from themselves, at every epoch of life, it must undoubtedly be because they look upon them as their heirs.

The parental apathy is to be imputed to the disorderly state of our manners, which has stifled the sentiments of Nature. Among the ancients, and even among savages, the perspective of social life presented a series of employments, from infancy up to old age, which among them was the era of the higher magistracies and priesthood. The hopes of their religion, at that period, interposed to terminate an honourable career, and concluded with rendering the plan of their life conformable to that of Nature. Thus they always kept up in the soul of their citizens that perspective of infinity so natural to the heart of man. But venality and debauched manners having subverted among us the order of Nature, the only age of human existence which has preserved its rights, is that of youth and love. This is the epoch to which all the citizens direct their thoughts. Among the ancients the aged bare rule, but with us young people assume the government. The old are constrained to retire from all public employment. Their dear children then pay them back the fruits of the education they had received from them.

Hence with us a father and mother, restricting the epoch of their felicity to the middle period of life, cannot without uneasiness behold their children approaching towards it, just in proportion as they themselves are withdrawing from it. As their faith is almost, or altogether extinguished, religion administers to them no consolation. They behold only death closing their perspective, and this renders them sullen, harsh,

and frequently cruel. (Hence the reason that parents do not love their children, and that our old people affect so many frivolous tastes, to bring themselves nearer to a generation which is repelling them.)

Another consequence of this state of manners is, that we are destitute of the spirit of patriotism. The ancients, on the contrary, had a great deal of it. The highest ambition of the Romans was to see their own age honoured and distinguished above every other age of the republic. Those among us who have any ambition that regards futurity, restrict it to the being themselves distinguished by the age in which they live. In this nearly terminates our natural ambition, directed as it is by our mode of education.

The ancients employed their thoughts in prognosticating the character and condition of their posterity, and we revolve what our ancestors were. They looked forward, and we look backward. If posterity is taken up with the ancients, it is because the ancients laboured for posterity; but if we do nothing for ours, assuredly they will pay no attention to us. They will talk as we do about the Greeks and the Romans, without wasting a single thought upon their fathers. Instead of falling into raptures over Greek and Roman medallions, half devoured by time, would it not be fully as agreeable, and much more useful, to direct our views to the subject of our fresh, lively, plump children, and to try to discover in their several inclinations who are to be the future co-operators in the service of their country? Those who in their childish sports are fond of building, will one day rear her monuments. Among those who take delight in managing their boyish skirmishes, will be formed the Epaminondases and the Scipios of future times. Those who are seated upon the grass, the calm spectators of the sports of their companions, will in due time become excellent magistrates and philosophers, the complete masters of their own passions. Those who in their restless course love to withdraw from the rest, will be noted travellers and founders of colonies, who shall carry our manners and language to the savages of America, or into the interior of Africa itself.

If we are kind to our children, they will bless our memory, and transmit, unaltered, our customs, fashions, education, government, and everything that awakens the recollection of us, to the latest posterity. We shall be to them beneficent

deities, who have wrought their deliverance from Gothic barbarism. We should gratify the innate taste of infinity still better, by launching our thoughts into a futurity of two thousand years, than into a retrospection of the same distance. This manner of viewing, more conformable to our divine nature, would fix our benevolence on sensible objects which do, and still are to exist. We should secure to ourselves, as a support to an old age of sadness and neglect, the gratitude of the rising generation; and, by providing for their happiness, and our own, we should promote the good of our country.

To contribute my little mite towards so blessed a revolution, I shall hazard a few more hasty ideas. I suppose then I am empowered to employ usefully a part of the twelve years which our young people spend at schools and colleges. I reduce the whole time of their education to three epochs of three years each. The first should commence at the age of seven years, as among the Lacedemonians, and even earlier: a child is susceptible of a patriotic education as soon as he is able to speak and to walk. The second with the period of adolescence; and the third end with it, towards the age of sixteen, an age when a young man may begin to be useful to his country, and to assume a profession.

I would begin with disposing in a central situation in Paris, a magnificent edifice, constructed internally in form of a circular amphitheatre, divided into ascending rows. The masters to be intrusted with the charge of the national education should be stationed below, in the centre; and above, I would have several rows of galleries, in order to multiply places for the auditors. On the outside, and quite round the building, I would have wide porticoes, story above story, for the reception and accommodation of the people. On a pediment over the grand entrance these words might be inscribed:

“NATIONAL SCHOOLS.”

I need not mention, that as the children pass three years in each epoch of their education, one of these edifices would be requisite for the instruction of the generation of the year, which restricts to nine the number of monuments destined to the general education of the capital. Round each of these amphitheatres there should be a great park, stored with the plants and trees of the country, scattered about with artificial

arrangement, as in the fields and the woods. The bowers of innocence should be no less interesting than the tombs of virtue.)

If I have expressed a wish to have monuments raised to the glory of those by whom our climate has been enriched with exotic plants, it is not that I prefer these to the plants of our own country, but in the view of rendering to the memory of those citizens a part of the gratitude we owe to Nature. Besides, the most common plants in our plains, independent of their utility, are those which recall to us the most agreeable sensations. The feathered sphere of the dandelion brings to my recollection the places where, seated on the grass with children of my own age, we endeavoured to sweep off by one whiff of breath all its plumage, without leaving a single tuft behind. Fortune in like manner has blown upon us, and has scattered abroad our downy-pinioned circles over the face of the whole earth. I call to remembrance, on seeing certain gramineous plants in the ear, the happy age when we conjugated, on their alternate ramifications, the different tenses and moods of the verb *aimer* (to love). We trembled at hearing our companions finish, after all the various inflexions, with *Je ne vous aime plus*, (I no longer love you.) The finest flowers are not always those for which we conceive the highest affection. The moral sentiment determines at length all our physical tastes.

✓ The plants of our country recall the idea of it in a manner still more affecting than its monuments; I would spare no cost, therefore, to collect them around the children of the nation. I would make their school a spot charming as their tender age, that when the injustice of their patrons, friends, relations, or fortune, may have crushed in their hearts all ties of country, the place in which their childhood had enjoyed felicity might still be their capital. I would present them with pictures after religious subjects; not such as are terrifying and excite man to repentance, but those calculated to encourage innocence. Such would be that of the Virgin holding the infant JESUS in her arms; that of JESUS himself in the midst of children displaying in their attitudes and features the simplicity and confidence of their age. Beneath might be inscribed these words of JESUS CHRIST himself: Suffer little children to come to me.'

Were it necessary to represent in this school any act of

justice, there might be a painting of the fruitless fig-tree withering away at his command. It would exhibit the leaves of that tree curling up, its branches twisting, its bark cracking, and the whole plant, struck with terror, perishing under the maledictions of the AUTHOR of Nature.

There might be inserted some simple and short inscription from the Gospel, such as this :—‘Love one another.’

Or this :—‘Come unto me, all ye that are heavy laden, and I will give you rest.’

And that maxim already necessary to the infant mind :—‘Virtue consists in preferring the public good to our own.’

And that other :—‘In order to be virtuous, a man must resist his propensities, his inclinations, his tastes, and maintain an incessant conflict with himself.’

Our name is the first and last possession at our own disposal ; it determines from the days of infancy our inclinations ; it employs our attention through life, nay, transports us beyond the grave. I have still a name left, is the reflection. It is a name that ennobles or dishonours the earth. I could wish, therefore, to have children distinguished by interesting names. A lad fathers himself upon his name. If it inclines toward any vice, or furnishes matter for ridicule, his mind takes a bias from it. Bayle remarks, that a certain inquisitor named Torre Cremada, or the Burnt Tower, had in his lifetime condemned many heretics to the flames. There is a farther absurdity in giving to children, destined to peaceful occupations, turbulent and ambitious names, and still more dangerous to give them ridiculous ones. I have seen poor boys so tormented on this account by their companions, and even by their own parents, from the silly circumstance of a baptismal name ; which implied some idea of simplicity and good nature, that they insensibly acquired an opposite character of malignity and ferociousness.

Government therefore ought to interpose in the business of giving names to children, as they have an influence so tremendous on the characters of the citizens. I could wish likewise that to their baptismal name might be added a surname of some family rendered illustrious by virtue, as the Romans did ; this species of adoption would attach the little to the great, and the great to the little.

I would not make use in this school of noisy bells to announce the different exercises, but of the sound of flutes, of

hautboys, and of bagpipes. Every thing they learned should be versified and set to music. The influence of these two arts united is beyond all conception. If music and poetry had the power, at Sparta, to recall corrupted men to the practice of virtue, and afterwards to govern them, what influence would they not have over our children in the age of innocence? Who could ever forget the sacred laws of morality, were they set to enchanting music?

These arrangements being made, the first branch of the education of children should be religion. I would begin with engaging them to fear and love God, but to fear Him not as an object of terror. Terrifying views of an amiable and good God generate superstition, and inspire horrible apprehensions of death. The first precept of religion is to love God. *Love, and do what you will*, was the saying of a saint. We are enjoined by religion to love Him above all things; we are encouraged to address ourselves to Him as to a Father. If we are commanded to fear Him, it is only with relation to the love which we owe Him, because we ought to be afraid of offending the person whom we are bound to love. Besides, I am very far from thinking that a child is incapable of having any idea of God before fourteen years of age, as has been advanced by a writer whom in other respects I love. Do we not convey to the youngest children sentiments of fear and aversion, for metaphysical objects which have no existence? Wherefore should they not be inspired with confidence and love for the Being who fills universal nature with his beneficence? Children have not the ideas of God such as are taught by systems of theology and philosophy; but they are perfectly capable of having the sentiment of Him, which as we have seen is the reason of Nature. Would to God I had preserved the sentiment of the existence of the Supreme Being, and of his principal attributes, as pure as I had it in my earliest years! It is the heart still more than the understanding that religion demands. And which heart, I beseech you, is most filled with the DEITY, and the most agreeable in his sight, that of the child who, elevated with the sentiment of Him, raises his innocent hands to Heaven as he stammers out his prayer, or of the schoolman who pretends to explain His Nature?

(It is very easy to communicate to children ideas of God and of virtue. The daisies springing up among the grass,

the fruits suspended on the trees of their enclosure, should be their first lessons in theology, and their first exercises of abstinence and obedience to the laws. Their minds might be fixed on the principal object of religion, by the pure and simple recitation of the life of JESUS CHRIST in the Gospel. They would learn in their Creed all that they can know of the nature of God, and in the *Pater-noster* everything that they can ask of Him.

Of all the sacred books, there is no one which children take in with so much facility as the Gospel. It would be proper to habituate them betimes to perform what is there enjoined, without vain-glory, or respect to human observation or applause. They ought to be trained up, therefore, in the habit of preventing each other in acts of friendship, in mutual deference, and in good offices of every kind.

All the children of citizens should be admitted into this national school. I would insist only on the most perfect cleanliness, were they dressed but in patches sewed together. There you might see the child of a man of quality, attended by his governor, arrive in an equipage, and take his place by the side of a peasant's child leaning on his little stick, dressed in canvass in the very middle of winter, and carrying in a satchel his little books, and his slice of brown bread for the provision of the whole day. Thus they would both learn to know each other before they came to be separated for ever. The child of the rich man would be instructed to impart of his superfluity to him who is frequently destined to support the affluent out of his own necessary pittance. These children of all ranks, crowned with flowers, and distributed into choirs, would assist in our public processions. Their age, order, songs, and innocence, would present in these a spectacle more august than the lackeys of the great bearing the coats-of-arms of their masters pasted to wax-tapers, and beyond all contradiction much more affecting than the hedges of soldiers and bayonets with which, on such occasions, a God of Peace is encompassed.

In this school children might be taught to read and cipher. Ingenious men have for this effect contrived boards, and methods simple, prompt, and agreeable. If you wish children to learn quickly to read, put a sugar-plumb over each of their letters; they will soon have their alphabet by heart, and if you multiply or diminish the number of them, they

will soon have become arithmeticians. They shall have profited wonderfully, however, in this school of their country, should they leave it without having learned to read, write, and cipher; but deeply penetrated with this one truth, that to read, write, and cipher, and all the sciences in the world, are mere nothings; but that to be sincere, good, obliging, to love God and man, is the only science worthy of the human heart.

At the second era of education, about the age of from ten to twelve, when their intellectual powers restlessly stir and press forward to the imitation of everything that they see done by others, I would have them instructed in the means which men employ in making provision for the wants of society; and subservient to the first necessities of human life, of the arts we denominate mechanical, and that of building houses. To these I would join the elements of the natural sciences, of geometry, and experiments of natural philosophy.

I would have them made acquainted with the liberal arts, as architecture and fortification, to show them how their habitation is constructed and their country defended. I would make them observe, as an antidote to the vanity of the sciences, that man, amidst such a variety of arts and operations, has imagined no one thing, but has imitated, in all his productions, either the skill of the animal creation, or the operations of Nature; I would make them sensible of these relations of the truths of religion to those of Nature, and thus dispose them to love the class of useful men who provide for their wants.

I would endeavour to make the exercises of the body go hand in hand with those of the mind. While they were acquiring a knowledge of the useful arts, I would have them taught Latin. I would not teach it metaphysically and grammatically, but they should learn it practically. The Polish peasantry acquire it thus, and speak it fluently and intelligibly, though they have never been at college. Two years at most are sufficient for the children of the national school to learn the Latin by practice, especially if in the lectures extracts were given from the lives of great men, written in good Latin, and well explained.

In the third period of education, nearly about the age when passions begin to take flight, I would show to ingenuous youth the pure and gentle language of them, in the eclogues and georgics of Virgil; the philosophy of them in some of

the odes of Horace ; and pictures of their corruption, taken from Tacitus and Suetonius. I would finish the painting of the hideous excesses into which they plunge mankind, by exhibiting passages from historians of the lower empire. I would make them remark how talents, taste, knowledge, and eloquence sunk at once among the ancients, together with manners and virtue. I would be very careful not to fatigue my pupils with reading of this sort ; I would point out to them only the more poignant passages, in order to excite in them a desire to know the rest. My aim should be not to lead them through a course of Virgil, of Horace, and of Tacitus, but a real course of classical learning, by uniting in their studies whatever men of genius have considered as best adapted to the perfecting of human nature.

I would have them practically instructed in the Greek, now on the decline among us. I would endeavour to make them sensible how at all times talents, virtues, great men, and states flourished together with confidence in the Divine Providence. But, to give greater weight to these eternal truths, I would intermingle with them the enchanting studies of Nature, of which they had hitherto only seen some faint sketches.

I would make them remark the disposition of this globe, suspended in a most incomprehensible manner upon nothing, with an infinite number of different nations in motion over its solid and liquid surface. I would point out in each climate the principal plants useful to human life ; the animals which stand related to those plants, and to their soil, without extending farther. I would then show them the human race, who alone of all sensible beings are universally dispersed, mutually to assist each other, and to gather at once all the productions of Nature. I would speak of the laws of nations, and lead them to an acquaintance with those of their own country. I would give them an idea of the principal religions which divide the earth, and demonstrate to them how highly preferable Christianity is to all the political laws and religions of the world, because it alone aims at the felicity of the whole human race. I would make them sensible that the Christian religion prevents the different ranks of society from hurting themselves by mutual collision, and gives them equal power of bearing up under the pressure of unequal weights. From these sublime considerations, the love of their country would

be kindled in those youthful hearts, and acquire an increasing ardour from the very spectacle of her calamities.

I would intermix these affecting speculations with exercises, useful, agreeable, and adapted to the vivacity of their time of life. I would have them taught to swim, not so much by way of security from danger in the event of suffering shipwreck, as in the view of assisting persons who may happen to be in that dreadful situation. Whatever advantage they might derive from their studies, I would never propose any other end but the good of their fellow-creatures. They should be instructed in military exercises, with a view of bringing into disrepute the art of fencing, useless and even hurtful in war, and which keeps up the murderous spirit of duelling among us. The pupils trained in the national schools should be taught to entertain a very different idea of courage : and in the course of their studies should be instructed in their duty towards a fellow-citizen and towards an enemy.

The season of youth would thus glide away agreeably and usefully ; the mind and body would expand together. The natural talents, frequently unknown in most men, would manifest themselves at sight of different objects. The attainment of all this various knowledge, I shall be told, will require a length of time ; but if we take into consideration that which is squandered away in our colleges, in the tiresome repetitions of lessons, in the grammatical decompositions and explications of the Latin tongue, which do not communicate to the scholar so much as facility in speaking it, and in the dangerous competitions of a vain ambition, it is impossible not to admit that we have been proposing to make a much better use of it.

In the national schools everything would go on after the academic manner of the Greek philosophers. The pupils should there pursue their studies, sometimes seated, sometimes standing ; sometimes in the fields, at other times in the amphitheatre, or in the part which surrounded it. There would be no occasion for pen, ink, or paper ; every one would bring with him only the classical book containing the subject of the lesson. I have had frequent experience that we forget what we commit to writing. This does not take place with regard to the impressions of conversation, especially if it be accompanied with striking circumstances.

The pupils should not be oppressed with an unprofitable and prattling science. Sometimes they should defend among

themselves the cause of a citizen, sometimes deliver their opinion respecting a public event. They should pursue the process of an art through its whole course. Their eloquence would be a real eloquence, and their knowledge a real knowledge. They should employ their minds on no abstruse science, in no useless research, usually the fruit of pride. In the studies I propose, everything should bring us back to society, concord, religion, and nature. These several schools should be decorated correspondently to their use ; the exterior should serve as walking places and asylums to the people, especially during the winter. There they should every day behold spectacles proper to inspire them with virtuous sentiments and with the love of their country.

Among those young people there should be no such thing as reward, nor punishment, nor emulation, and consequently no envy. The only punishment there inflicted should be to banish from the society the person who should disturb it, and even that only for a time proportioned to the fault of the offender ; and this should rather be an act of justice than a punishment, for I would have no manner of shame attach to that exile. But if you wish to form an idea of such an assembly, conceive, instead of our young collegians, pale, pensive, jealous, trembling about the fate of their unfortunate compositions, a multitude of young persons, gay, content, attracted by pleasure to vast circular halls, in which are erected here and there the statues of the illustrious men of antiquity and of their own country : behold them all attentive to the master's lessons, assisting each other in comprehending and retaining them, and in replying to his unexpected questions. One tacitly suggests an answer to his neighbour ; another makes an excuse for the negligence of his absent comrade.

Represent to yourself the rapid progress of studies elucidated by intelligent masters, and drunk in by pupils who are mutually assisting each other in fixing the impression of them. Figure to yourself science spreading among them, as the flame in a pile, all the pieces of which are nicely adjusted, communicates from one to another, till the whole becomes one blaze. Observe among them, instead of a vain emulation, union, benevolence, friendship, for little services rendered and repaid. The recollection of those early intimacies will farther unite them in the world, notwithstanding

the prejudices of their various conditions ; for at this tender age gratitude and resentment become engraved for the rest of life as indelibly as the elements of science and religion.

Before we could pretend to establish those national schools, we must have men formed to preside in them. I would not have them chosen from among those who are most powerfully recommended. The more powerful recommendations they might have, the more would they be given to intrigue, and consequently the less would be their virtue. The inquiry made among them, ought not to be, Is he a wit, a bright man, a philosopher? But, is he fond of children? Does he frequent the unfortunate rather than the great? Is he a man of sensibility? Does he possess virtue? In persons of such a character we should have masters proper for conducting the public education. A titled magistrate should preside every day in each school. It would be very becoming that the magistrates should cause to be trained up, under their own eyes, to justice and to the laws, the children whom they are one day to judge and to govern as men. No revenue should be annexed to this sublime duty, and the only honour that could possibly be claimed should be that of presiding.

Would to God it were in my power to conciliate the education of women to that of men, as at Sparta! But our manners forbid it. There could not, however, be any great inconvenience in associating in early life the children of both sexes. Their society communicates mutual grace; besides, the first elements of civil life, religion, and virtue, are the same for both. This first epoch excepted, young women should learn nothing of what men ought to know; not that they are to remain always in ignorance of it, but that they may receive instruction with increased pleasure, and one day find teachers in their lovers. (There is this moral difference between man and woman, that the man owes himself to his country, and the woman is devoted to the felicity of one man alone.) A young woman will never attain this end but by acquiring a relish for the employments suitable to her sex. To no purpose would you give her a complete course of the sciences, and make her a theologian or a philosopher; a husband does not love to find either a rival or an instructor in his wife. Books and masters with us blight betimes, in a young female, virgin ignorance, that flower of the soul which a lover takes such delight in gathering. They rob a husband

of the most delicious charm of their union, of those inter-communications of amorous science, and native ignorance, so proper for filling up the long days of married life. They destroy those contrasts of character which Nature has established between the sexes, in order to produce the most lovely of harmonies.

I could wish, therefore, that our young people might have it in their power to cultivate the sentiment of love in the midst of their labours, as Jacob did.* No matter at what age; when capable of feeling, we are so of loving. Honourable love suspends pain, banishes languor, saves from prostitution, from the errors and the restlessness of celibacy: it fills life with delicious perspectives, by displaying in futurity the most desirable of union: it augments, in the hearts of two youthful lovers, a relish for study and a taste for domestic employments. What pleasure must it afford a young man, transported with the science which he has derived from his masters, to repeat the lessons of it to the fair one whom he loves! What delight to a young and timid female to see herself distinguished amidst her companions, and to hear the value and the graces of her little skill and industry exalted by the voice of her lover!

A young man, destined one day to repress on the tribunal the injustice of men, is enchanted, amidst the labyrinths of of law, to behold his mistress embroidering for him the flowers which are to decorate the asylum of their union, and to present him with an image of the beauties of Nature, of which the gloomy honours of his station are going to deprive him for life. Another, devoted to conduct the flame of war, attaches himself to the gentle spirit of his female friend, and flatters himself with the thought that the mischief he may do to mankind shall be repaired by the blessings she bestows on the miserable. Friendships multiply in families; of the friend to the brother who introduces him, and of the brother to the sister. The kindred are mutually attracted. The young folks form their manners; and the happy perspectives which their union discloses cherish in them the love of their several duties, and of virtue.

(If a happy revolution is to be hoped for in our country, it is to be effected only by calling back the women to domestic

* Genesis, chap. xix. ver. 20.

manners. Whatever satire may have been levelled against them, they are less culpable than the men. They are chargeable with hardly any vices except those which they receive from us; and we have many from which they are free. What must have become of a state of society abandoned to all the absurdities of our education, to all the prejudices of our various conditions, and to the ambitions of each contending party, had not the women crossed us upon the road? These, thrown out of their natural state by our unjust manners, laugh at and destroy everything, the great fortunes, pretensions of pride, and prejudices of opinion. Women have only one passion, which is love, and this passion only one object; whereas men refer everything to ambition, which has thousands. A provincial, and even a Parisian tradesman, hardly behaves with kindness to his children when somewhat grown up; but he bends with profound reverence before those of strangers, provided they are of rich or of high quality: his wife is regulated in her behaviour to them by their figure. If they are homely, she neglects them; but will caress a peasant's child if it is beautiful; she will pay more respect to a low-born man with gray hairs and a venerable head, than to a counsellor without a beard. Women attend only to the gifts of Nature, and men to those of fortune. Thus the women amidst all their irregularities still bring us back to Nature, while we, with our affectation of superior wisdom, are in a constant tendency to deviation from her.

As well as ourselves, women will never find happiness except in the practice of virtue. In all countries where the empire of virtue is at an end, they are most miserable. They were formerly happy in the virtuous republics of Greece and Italy, where they decided the fate of states: at this day, reduced to the condition of slaves in those very countries, the greatest part of them submit to prostitution for the sake of a livelihood. Ours ought not to despair of us. They possess over man an empire absolutely inalienable; we know them only under the appellation of the sex, to which we have given the epithet of fair by way of excellence. But how many descriptive epithets, still more interesting, might be added to this, such as those of nutritive, consolatory! They receive us on our entrance into life, and they close our eyes when we die. Not to beauty, but religion, are our women indebted for their influence; the same Frenchman who in

Paris sighs at the feet of his mistress, holds her in fetters, and under the discipline of the whip, in St. Domingo. The Christian religion alone contemplates the conjugal union in the order of Nature: it is the only religion which presents woman to man as a companion; every other abandons her to him as a slave. To religion alone do European women owe the liberty they enjoy: and from the liberty of women that of nations has flowed, accompanied with the proscription of many inhuman usages diffused over all the other parts of the world, such as slavery, seraglios, and eunuchs. O charming sex! in your virtue your power consists. Save your country, by recalling to the love of domestic manners your lovers and husbands, from a display of your gentle occupations. Envy not the other sex their authority, their talents, their vainglory; but in the midst of your weakness, surrounded with your wools and your silks, give thanks to the **AUTHOR** of Nature for having conferred on you alone the power of being always good and beneficent.

RECAPITULATION.

I HAVE presented in this work the different paths of Nature I proposed to pursue, in forming an idea of the order which governs the world. I first brought forward the objections raised in all ages against a Providence, and exhibited them as applied to the several kingdoms of Nature, one after another; which furnished me with an opportunity, in refuting them, of displaying views entirely new respecting the disposition and the use of the different parts of this globe. In the next place, I have refuted in order the objections raised on the subject of the vegetable and animal kingdoms, by demonstrating that these kingdoms were no more governed by mechanical laws than the fossil kingdom is. I have farther demonstrated, that the greatest part of the ills which oppress the human race are to be ascribed to the defects of our political institutions, and not to those of Nature; that man is the only being who is abandoned to his own providence, as a punishment for some original transgression; but that the same **DEITY** who had given him up to the direction of his own

intelligence, still watched over his destination ; that he caused to recoil on the governors of the nations the miseries with which they overwhelm the little and the weak ; and I have demonstrated the action of a Divine Providence from the very calamities of the human race. Such is the subject of my first part.

In the opening of my second, I have attacked the principles of our sciences, by evincing that they mislead us, either by the boldness of those same principles, from whence they would soar up to the nature of the elements which elude their grasp, or by the insufficiency of their methods, which are capable of catching only one law of Nature at once, because of the weakness of our understanding and of the vanity inspired by our education, whereby we are betrayed into the belief that the little paths in which we tread are the only roads leading to knowledge. I afterwards set out in quest of a faculty better adapted to the discovery of truth than our reason, which after all is nothing but our personal interest merely. I flatter myself I have found it in that sublime instinct called *sentiment*, which is in us the expression of natural laws, and is invariable among all nations. (By means of it I have observed the laws of Nature, not by tracing them up to their principles, known to God only, but by descending into their results, destined to the use of man.) I have had the felicity, in pursuance of this track, to perceive certain principles of the correspondences and harmonies which govern the world. The ancient Egyptians studied Nature in Nature herself, and not by piecemeal and with machines. Hence they formed a most wonderful science under the name of magic. The elements of this science are now unknown ; its name alone remains, and is at this day given to operations the most stupid in which the error and depravity of the human heart can be employed. This was not the character of the magic of the ancient Egyptians, so much celebrated by the most respectable authors of antiquity, and by the sacred books themselves.

Though my incapacity is very great, these harmonic principles are so luminous, that they have presented to me not only dispositions of the globe entirely new, but have furnished me with the means of distinguishing the characters of plants on the first inspection, so as to be able to say at once, This is a native of the mountains, That an inhabitant of the shores. By them I have demonstrated the use of the leaves of plants,

and determined by the nautical or volatile form of their grains their relations to the places where they are destined to grow. ~~Finally~~, I have indicated their relations to animals and to man to such a degree, that I am confident to affirm, I have demonstrated there is not a single shade of colour impressed by chance through the whole extent of Nature.

By prosecuting these views, I have supplied the means of forming complete chapters of natural history, from having evinced that each plant was the centre of the existence of an infinite number of animals, which possess correspondences with it to us still unknown. Their harmonies might undoubtedly be extended much farther; for many plants seem to have relations not only to the sun, but to different constellations. It is not always such an elevation of the sun above the horizon which elicits the vegetative powers of plants. Such a one flourishes in the spring which would not put out the smallest leaf in autumn, though it might then undergo the same degree of heat. The same thing is observable with respect to their seeds, which germinate and shoot at one season and not at another, though the temperature may be the same. These celestial relations were known to the ancient philosophy of the Egyptians and of Pythagoras. We find many observations on this subject in Pliny, Virgil, and Linnæus; but we have indicated vegetable harmonies still more interesting, by demonstrating that the time of the expansion of every plant, of its flowering, and of the maturity of its fruit, was connected with the expansions and the necessities of the animal creation, and especially with those of man. There is not a single one but what possesses relations of utility to us, direct or indirect; but this immense and mysterious part of the history of man will perhaps never be known.

My third part presents the application of these harmonic principles to the nature of man himself. In it I have shown, that he is formed of two powers, the physical and the intellectual, which affect him perpetually with two contrary sentiments, that of his misery and of his excellence. I have demonstrated, that these two powers were most happily gratified in the different periods of the passions, ages, and occupations to which Nature has destined man, such as agriculture, marriage, the settlement of posterity, and religion.

I have dwelt principally on the affections of the intellectual power, by rendering it apparent that everything delicious

and transporting in our pleasures arose from the sentiment of infinity, or some other attribute of DEITY, which discovered itself as the termination of our perspective. I have demonstrated, on the contrary, that the source of our miseries and errors might be traced up to this, That in the social state we frequently cross those natural sentiments by the prejudices of education and society ; so that, in many cases, we make the sentiment of infinity to bear upon the transient objects of this world, and that of our frailty and misery upon the immortal plans of Nature. I have only glanced at this rich and sublime subject ; but I assert with confidence, that by pursuing this track simply, I have sufficiently proved the necessity of virtue, and indicated its real source, not where our modern philosophers seek for it, namely, in our political institutions, often diametrically opposite to it, but in the natural state of man, and in his own heart.

I have afterwards applied the action of these two powers to the happiness of society, by showing, first, that most of the ills we endure are only social reactions, all of which have their grand origin in overgrown property, in employments, in honours, in money, and in land. I have proved that those enormous properties produce the physical and moral indigence of a nation ; that this indigence generated in its turn swarms of debauched men, who employed all the resources of craft and industry to make the rich refund the portion which their necessities demand ; that celibacy, and the disquietudes with which it is attended, were in a great many citizens the effects of that state of penury and anguish to which they found themselves reduced ; and that their celibacy produced, by repercussion, the prostitution of women of the town. From these principles I have deduced a variety of important consequences.

I have finally demonstrated, That no inconsiderable part of our physical and moral maladies proceeded from the chastisements, the rewards, and the vanity of our education.

I have hazarded sundry conjectures, in the view of furnishing to the people abundant means of subsistence and of population, and of reanimating in them the spirit of religion and of patriotism, by presenting them with certain perspectives of infinity, without which the felicity of a nation, like that of an individual, is negative, and quickly exhausted, were we to form plans in other respects the most advantage-

ous, of finance, commerce, and agriculture. Provision must be made at once for man, as an animal and as an intelligent being. I have terminated those different projects, by presenting the sketch of a national education, without which it is impossible to have any species of legislation or of patriotism that shall be of long duration. I have endeavoured to unfold in it at once the two powers, physical and intellectual, of man, and to direct them towards the love of country and of religion.

I must no doubt have frequently gone astray in pursuing paths so new and so intricate. I must have many a time sunk far below my subject, from the construction of my plans, from my inexperience, from the very embarrassment of my style ; but, I repeat it, provided my ideas shall suggest superior conceptions to others, I am well satisfied. At the same time, if calamity be the road to truth, I have not been destitute of means to direct me towards her. Were I to publish the memoirs of my own life, I could wish for no stronger proof of the contempt which the glory of this world merits, than to hold up to view the objects of it. At the time when, unconscious of having committed the slightest injury to any one, after an infinity of fruitless voyages, services, and labours, I was preparing in solitude these last fruits of my experience and application, my secret enemies found means to intercept a gratuity which I annually received from the beneficence of my sovereign. It was the only source of subsistence to myself, and the only means I enjoyed of assisting my family. To this catastrophe were added the loss of health, and domestic calamities which baffle all the powers of description. Had I reposed in God that confidence which I put in men, I should always have enjoyed undisturbed tranquillity : the proofs of his Providence as affecting myself, in the past, ought to set my heart at rest about futurity. But from a fault of education the opinions of men still exercise too much dominion over me ; but if I have reason to flatter myself that this work is contributing to multiply marriages, to render them more happy, and to soften the education of children, I shall consider my own family as perpetuated in them, and I shall look on the wives and children of my country as in some sense mine.

Nothing is durable, virtue alone excepted. Personal beauty passes quickly away ; fortune inspires extravagant inclina

tions ; grandeur fatigues ; reputation is uncertain ; talents, nay, genius itself, are liable to be impaired : but virtue is ever beautiful, ever diversified, ever equal, and ever vigorous, because it is resigned to all events, to privations as to enjoyments, to death as to life.

Happy, then, happy beyond conception, if I have been enabled to contribute one feeble effort towards redressing some of the evils which oppress my country, and to open to it some new prospect of felicity ! Happy, if I have been enabled to wipe away, on the one hand, the tears of some unfortunate wretch, and to recall, on the other, men misled by the intoxication of pleasure, to the DIVINITY, towards whom Nature, the times, our personal miseries, and our secret affections, are attracting us with so much impetuosity !

THE END.

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